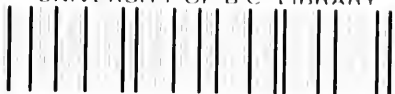


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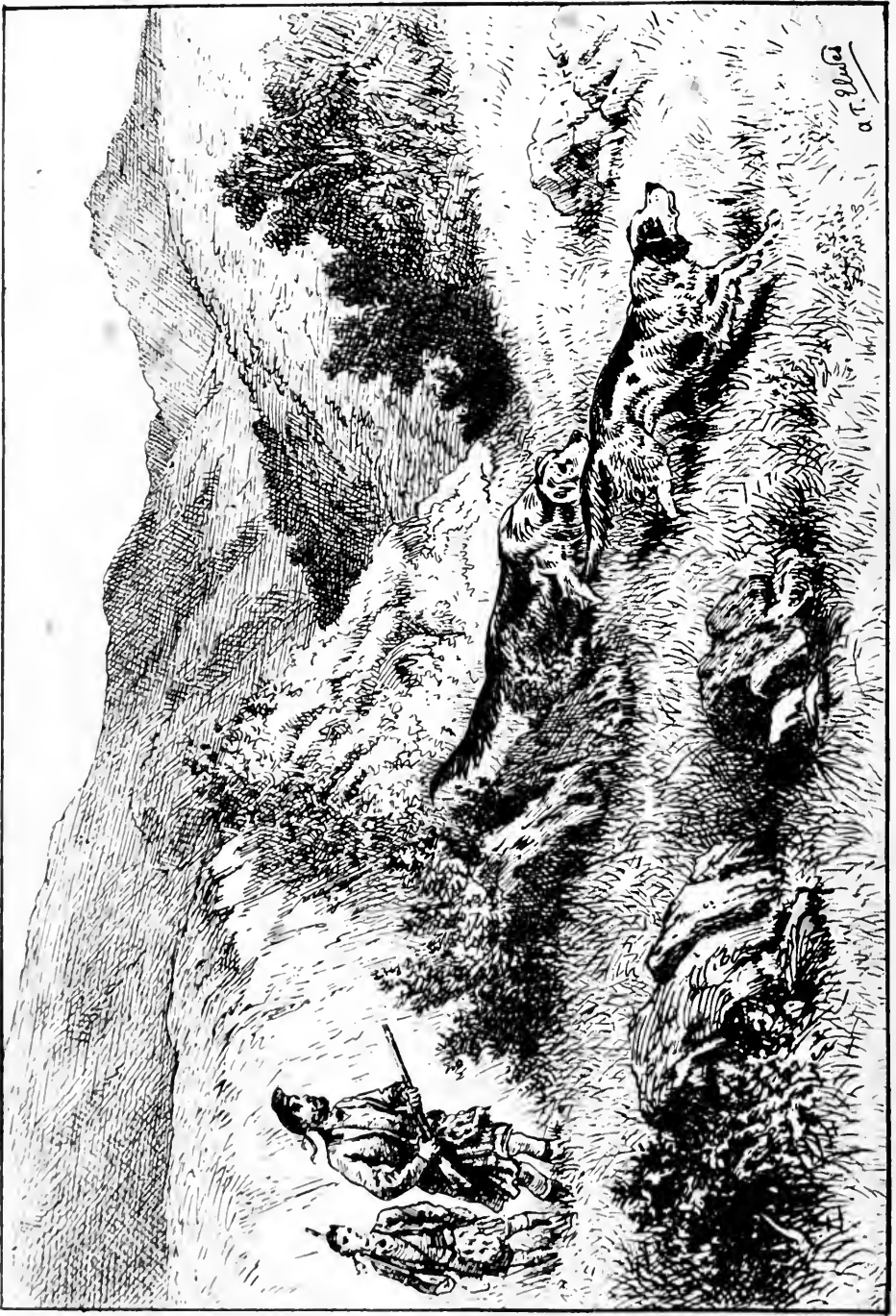
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FRONTISPIECE.

GROUSE DISEASE:

ITS CAUSES AND REMEDIES.

BY

DUNCAN GEORGE FORBES MACDONALD,

C.E., LL.D., J.P., F.R.G.S.,

AUTHOR OF

"WHAT THE FARMERS MAY DO WITH THE LAND," "ESTATE MANAGEMENT,"
"HINTS ON FARMING," "CATTLE, SHEEP, AND DEER,"
"THE HIGHLAND CROFTERS," ETC., ETC.

WITH SIX FULL-PAGE ILLUSTRATIONS.

Third Edition.

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PREFACE TO THE THIRD EDITION.

THE previous editions of "Grouse Disease: Its Causes and Remedies," having been disposed of, and the demand continuing, a Third Edition is here presented to the Public. To the care I bestowed in giving to my suggestions a thoroughly practical character may be ascribed the great favour with which the other volumes have been received by those interested in the subject.

• Born and bred in the Highlands,—a sportsman from my youth,—with an intimate knowledge of grouse moors, and having necessarily associated freely with sportsmen, ornithologists, and keepers, my acquaintance with the subject of grouse disease and its causes inspires me with a lively hope that my observations may prove of service by indicating the means of remedying an evil which has long

vexed the minds of owners of Highland estates, sportsmen, and others.

It is gratifying to me to find that the book answers the purpose for which it has been written, that the Press has reviewed it in highly complimentary terms, and that many well-known sportsmen, naturalists, and keepers have expressed their opinions that I have dealt with the subject in a practical and comprehensive manner.

D. G. F. M.

LYMINGTON HOUSE,
BRIGHTON, 1883.

GROUSE DISEASE.

CHAPTER I.

Let others love the city,
And gaudy show at sunny noon
Give me the lonely valley,
The dewy eve and rising moon,
Fair beaming and streaming
Her silver light the boughs among.

THE national love of sport has made Highland shootings such an important element in the value of estates, that it is surprising moors are so generally neglected. Since grouse disease depreciates this class of property, we will define its cause or causes and remedies. We do not agree with those who hold that the malady is a mystery beyond solution; but, on the contrary, that moors are in many cases sacrificed by carelessness, indifference, and the unwise policy of destroying all birds and beasts of prey alike, and not burning the old heather periodically.

We are convinced that were landowners to apply the same careful attention to moors as they do to

farms, very little would be heard of grouse disease. The marvel is that it is not more prevalent considering how many of the grouse ranges are mismanaged by allowing the growth of unwholesome food for the birds and upsetting the organization of nature, instead of being guided by her unerring laws. The penalty of such folly is, as a matter of course, grouse disease.

Come forth into the light of things,
Let Nature be your Teacher.

We took a great deal of trouble to get trustworthy information as to the prospects of the moors for 1882, and we published the result in the Press in July. Since then the tidings as to the crop of grouse have fully confirmed our predictions ; and the gloomy forebodings of some discontented persons have been proved to have been greatly exaggerated. Spread over so large an area of the British Islands as the red grouse is, the reports naturally vary considerably. The accounts received by us, together with the consignments of birds to the South, and the Press reports, testify that on the high grounds sport has been fairly good, whilst on the low-lying moors grouse were not only plentiful but in excellent condition, with few exceptions,—all, in short, that the most cynical gunner could have desired. On some of the very high lands the birds were not altogether free from disease, which was more prevalent in Ayrshire, Perthshire, Invernessshire, and Caithness. On the English and Welsh moors sport has been much above the average, and

far better than in 1881. A few birds were found dead, which the sportsmen attributed to indigestion.

There is hardly any kind of rural sport of which the characteristics are so picturesque as those of grouse shooting. It is at the golden time of the year, when everything in nature is so beautiful, that we seek out the heath-frequenting broods ; when the dear old straths and glens, the sweet heather air, and the birch and hazel, the ferns and ash saplings, the wild lakes and streams and foaming falls, the hills and mountains, are at their best. Truly "Caledonia stern and wild" is the El Dorado—the happy chosen land of the grouse shooter.

Hie away, hie away,
Over bank and over brae,
Where the copsewood is the greenest,
Where the fountains glisten sheenest,
Where the lady fern grows strongest,
Where the morning dew lies longest,
Where the blackcock sweetest sips it,
Where the fairy latest trips it ;
Hie to haunts right seldom seen,
Lovely, lonesome, cool, and green.
Over bank and over brae,

Hie away ! Hie away !

Even in the depth of winter shooting has its attractions. The world of nature is more open to us. Especially lovely are the lakes and meres when frost has bound the land in its iron chain, when the hills and vales are clad in snow, and the wild fowl peal forth sweet music to the whistling winds as they

tread and break the frozen rotting reeds glittering in the clear sunlight. Verily there is a charm in winter shooting that the true sportsman feels as he pursues his quarry through the snow, under a dark blue sky or a bright moonlight night, as he sees coot, teal, and widgeon on the crystal lake, and hears overhead the call-notes of wild-fowl as they fly from mere to mere. For pleasant memories of sport give us the hills and glens and lakes and meres of bonnie Scotland, whether in summer, autumn or winter—they are ever full of interest to the sportsman and naturalist.

At times, too, the shooter falls in with whole battalions of wild swans, although we admit that his chances of bagging

That lovely thing,
Oaring with rosy feet its silver boat,

are few and far between. They are seldom to be met with except in severe winter; but as their flight is very low they are not difficult of approach. In all animated nature there is hardly a more brilliant sight than a flight of swans, their spotless robes glistening in the clear golden light of the winter's sun. We can never forget the thrill of delight when we shot for the first time one of these magnificent creatures in the Cromarty Frith. It was a fine specimen, of nineteen pounds weight, with splendid plumage. Although we considered this as an epoch in our life we have often almost repented the destruction of so lovely a bird.

The eager demand for grouse-moors, and the enor-

mous rents now given, are evidence of the rapid growth of the world's wealth, and that the interest taken in the feathered denizens of the hills is not flagging. There are many examples of the marvellous increase of rents within the last forty or fifty years, as the following statement condensed from the "Quarterly Review" shows. In the counties of Perth, Inverness, and Ross, Highland properties have doubled in value within the last forty-five years. The shootings of Glen Urquhart were in 1836 let for one hundred pounds; they now produce a rental of about two thousand pounds. The Glen Morison moors were rented for one hundred pounds in 1835; they now bring in nearly three thousand pounds a year. The shootings attached to the Erchless Castle, as well as those of Fasnakyle, may be taken as fair examples of the rise of shooting-rents. These have increased at least twenty times in value in the course of as many years. One of the first shootings let was Monalia or Coignafearn, on which moors the river Findorn has its source. They are the property of the Mackintosh, and were first let to a Mr. Windsor at a rent of thirty pounds, with five pounds given back as a luckpenny. Some twenty years ago these shootings were let at rents varying from three hundred pounds to five hundred pounds. The Aberarder moors were on lease forty years ago at seventy pounds; the rent has been for years back, on an average, four hundred pounds. Stratherrick, for years let at an exceedingly

small rental, now brings in annually about six thousand six hundred pounds, besides what is retained by the proprietors for their own sport. These facts may be taken as a sample of the effects resulting from the growing taste for Highland life and Highland sports. A glance at the lists of shooting quarters to be let will give some idea of the scale of prices demanded. We find Upper Killin (seventeen thousand acres) advertised at five hundred and fifty pounds; Glenquoich, one thousand seven hundred pounds; the Macdonald estates in Skye, an aggregate of one thousand two hundred and fifty pounds; Auchonachie and Cabaan, seven hundred pounds; Kinlochluichart, two thousand pounds; Kinlochewe, one thousand two hundred pounds; Upper Strathmore, and other ranges belonging to the same proprietor, one thousand and forty-seven pounds. In one list alone we count more than two hundred names of northern shooting quarters actually in occupation. It is to be remembered that these consist only of such as have come under the immediate notice of one agent alone.

The Duke of Sutherland's extensive shootings and forests are so well known for their excellent sporting qualities that, at the time we write, none remain to be let. The other great grouse districts in rotation after Stratherrick, south of Inverness, are Strath Nairn, Strathdearn, and Strathspey; all of which are noted for sport, and bring rents equal to any in Scotland. In fact, shootings and deer-forests make up a

very considerable portion of the rent-rolls of Highland properties. They bring the highest rentals, and when put in the market they fetch large prices. And, whatever may be said to the contrary, we believe we are fully justified in considering that northern estates represent the capital which they bring at the hammer in public competition.

Fifty years ago, the very names of the greater part of these places were unheard of beyond their own immediate neighbourhood, and the game made no return whatever to the proprietor of the land. Since then rents have gone on steadily increasing. The late Mr. Snowie, of Inverness, who was so well known in connection with Highland shootings, now represented by his sons, had been in the habit for years of publishing an advertisement-sheet of places to be let. His first list was printed in 1836. It contained only eight advertisements; but the demand for moors has increased so steadily that for nearly twenty years he had printed three, sometimes four, lists each year, and circulated as many as one thousand five hundred copies annually. We are informed that the demand for shootings in the north is so great that there are hardly any now in the market, although higher and higher rents are given year after year; also, that the moors and forests are now taken so much on lease that there will be fewer to be let by the season hereafter. In short, that it will soon be difficult to get any at all by the season.

We gather the following information from Mr. H. C. Fraser's interesting and useful little work on "The Land Statistics of the Shires of Inverness, Ross, and Cromarty." The lairds of Inverness, it appears, hold three shootings in their own hands, worth seven hundred and ten pounds; and nine deer-forests, three thousand and eighty pounds—together, three thousand seven hundred and ninety pounds; while the most part is divided among one hundred and fifty-two tenants, viz. one hundred and thirty-two shootings, twenty-five thousand eight hundred and ninety-five pounds; and twenty deer-forests, eleven thousand five hundred and twenty-three pounds—together, thirty-seven thousand four hundred and eighty-eight pounds: total value, forty-one thousand two hundred and seventy-eight pounds. Adding part of fishings let for the purpose, the "sporting rents" in the shire of Inverness may be estimated at forty-four thousand five hundred pounds. At the same time, twenty-two shootings unlet, at the average value of those let (one hundred and ninety-seven pounds), may be set down at four thousand three hundred and thirty-four pounds, and one deer-forest at eight hundred pounds; in round numbers, fifty thousand pounds as the annual value of shootings and allied properties in the county.

According to a return presented to the House of Commons, the fixed and floating capital engaged in the cotton trade is put down at eighty-eight million

pounds; in the iron trade at twenty-five million three hundred thousand pounds; and in the woollen trade at twenty-two million pounds. What then is the amount of fixed and floating capital employed in the shootings and deer-forests in the Highlands? The fixed capital in the deer-forests and shootings is represented by the value of the estates. We have not correct data to fix the value of all deer-forests and shootings in the Highlands, but we have the annual valuation of "sporting rents" in two counties, Inverness and Ross — Inverness-shire (as above), fifty thousand pounds; Ross-shire, thirty-three thousand pounds; at twenty-five years' purchase, this is equal to two million and seventy-five thousand pounds. We may estimate the floating capital—that is, the expenditure of the sportsmen in wages, taxes, appliances, &c.—at about one-half of the rent, at five years' purchase, equal to two hundred and seven thousand five hundred pounds, making about two million two hundred and eighty thousand pounds in these two counties alone. Taking the remaining Highland counties, Caithness, Sutherland, Argyle, Perth, and Dumbarton, with the mountainous parts of Aberdeen, Banff, and Moray, and other districts, it will be a fair estimate to consider the annual value of the deer-forests, shootings, and fishings, let for sporting purposes in the Highlands, equivalent to the profits of twelve million four hundred thousand pounds of invested capital. Although this may seem a large

amount, we do not consider it at all above the mark.

We have already given examples of the great rise in this species of property which fifty or sixty years ago was regarded of little value in a monetary point of view. The shootings, deer-forests, and fishings in Ross-shire now amount to thirty-three thousand six hundred and ninety-one pounds annually. The sums placed opposite each of these descriptions of property and their total value must not, however, be regarded as absolutely correct. In several instances, shootings and deer-forests are valued together, while those unlet are not returned; but the sum of the three may be held as the beneficiary value derived by proprietors from the *feræ naturæ* on their estates. It must also be noticed that the fishings include river and sea-fishings rented for commercial purposes; so that a certain deduction must be made to arrive at what may be called the sporting rents, which may be estimated at thirty-three thousand pounds per annum. The proprietors retain in their own possession—shootings, four hundred and thirty-five pounds; fishings, one thousand and forty-two pounds; deer-forests, three thousand six hundred and thirty-seven pounds—total, five thousand one hundred and fourteen pounds; while the main part is divided among one hundred and thirty-nine tenants, viz. eighty-seven shootings at fifteen thousand and twenty-nine pounds; thirty-two fishings at three thousand and twenty-eight

pounds; twenty deer-forests at ten thousand five hundred and twenty pounds; total, twenty-eight thousand five hundred and seventy-seven pounds. There are also six shootings unlet, which, at the average value of those let, amount to one thousand and forty-eight pounds. Thus then we have a total annual value in shootings, deer-forests, and fishings of about eighty thousand pounds, in round numbers, for Inverness-shire and Ross-shire alone. Mr. Winans, of Brighton, pays the largest rent—about seventeen thousand pounds per annum — and occupies more than two hundred and twenty thousand acres.

Captain Horatio Ross, the veteran sportsman of world-wide fame, stated, in the evidence he gave before the Select Committee appointed to consider the Game Laws, in reference to the increase in the selling value of Highland estates:—"There is the estate of Applecross, which I had a great deal to do with, for I may say that I bought it for the Duke of Leeds in 1854. I do not mean that I was the agent, for I am no lawyer; but it was by my advice and through my negotiation that it was purchased. He gave one hundred and thirty-five thousand pounds for that estate. There were no forests on it then, but he made the two forests of Applecross and Coulin. He died, and it was sold in 1860 for two hundred and thirteen thousand pounds. Now comes this most striking circumstance: one lot was purchased by Lord Hill for seventy-six thousand pounds; he laid out about

from twelve thousand to fourteen thousand pounds on a house and some buildings, and that lot for which he gave seventy-six thousand pounds has since been sold in different lots for one hundred and ninety-one thousand pounds. In 1872 a third part of the estate (the whole estate having originally cost one hundred and thirty-five thousand pounds) has been sold for fifty-six thousand pounds more than was paid for the whole in 1854, and that is entirely owing to the deer-forests. I may also say that the rents on Lord Hill's part, when he bought it, were about one thousand and fifty pounds, the grazing and shootings and all; but when it was sold the other day, the one portion called Aughnashellach, the grazing rent according to the valuation roll (it being in the hands of the proprietor, the shooting rent was not put down, the proprietors only paying for the assessment upon the grazing rent), was eight hundred and thirty-five pounds. And the grazing rent of a small forest called Coulin, which adjoins it, was three hundred and forty-five pounds, that is, one thousand one hundred and eighty pounds; this rent of one thousand one hundred and eighty pounds, exclusive of the deer-forests—for this was what the grazing was leased at—sold last year for one hundred and forty thousand pounds. There was another small estate called Monar, which was bought in 1838 for sixteen thousand pounds, and it was converted into a deer-forest, and about two-thirds of it was sold about ten years ago for forty thousand

pounds. The estate of Harris was bought in 1831 for sixty thousand pounds, and one-half was converted into deer-forest, and that half was sold last year for one hundred and fifty-five thousand pounds. These are some of the details of the effects of deer-forests upon the selling price of the land.”

In this, as in all marketable commodities, the prices are regulated by the law of demand and supply. As long as there exists a class of men doomed for three-fourths of the year to sedentary occupations, but with wealth enough to enable them to enjoy the mountain air and the bracing exercise of the chase, even though many of them should be but indifferent sportsmen, so long will the price of Highland property increase and the rentals of shootings rise. At the rate of twenty-five pounds a head is now paid for deer-forests and at least a guinea a brace for grouse moors. Some sportsmen pay much higher. We find that Mr. Hall, Old Bond Street, London, has estimated the value of shootings let in Scotland last year as follows:—Aberdeenshire, thirty-thousand pounds; Argyle, twenty-five thousand pounds; Banff, six thousand five hundred pounds; Caithness, ten thousand pounds; Dumbarton, five thousand pounds; Elgin, eleven thousand pounds; Forfar, twenty thousand pounds; Inverness, one hundred thousand pounds; Kincardine, three thousand five hundred pounds; Nairn, one thousand five hundred pounds; Perth, eighty thousand pounds; Ross and Cromarty, sixty thou-

sand pounds; Sutherland, twenty thousand pounds. He believes that the most valuable moors are those of Perthshire, yielding over one hundred brace of grouse to the thousand acres, and that two thousand brace is about the maximum bag in this county in one season. Aberdeenshire has, however, given the "biggest bag," seven thousand brace having been shot on a moor in the great grouse season of 1872. Inverness, Ross, Sutherland, and Caithness yielded splendid bags in many instances last season; several sportsmen having run up bags of two thousand brace and upwards.

Here we may refer to a practice which is likely to lessen the demand for shootings. We allude to the attractive advertisements which agents are in the habit of inserting in the newspapers when they have shootings to let. This is all very well when the game is abundant; but when game is scarce, it is discreditable to the proprietors, whom it reduces to the rank of huckstering shopkeepers. There are some landowners, though we are happy to say few, who delight in catching dupes, not only by alluring and specious advertisements, but by employing "game-copers" to do their work of deception. In the progressive age in which we live,—but we fear progressive rather in astuteness than in morality,—circumspection in all matters in which investments are to be made seems to be imperatively required. It would be amusing, were it not really fraudulent,

to observe that comparatively grouseless moors are offered to sportsmen on the condition that the number of grouse to be killed will be limited. This is an old and stale device. The number is usually put at several hundred brace more than are to be found on the ground. The object, of course, is to induce a belief in the minds of sportsmen that there must be, at least, as many as the number named as the limit. We have known moors where one thousand brace was the limit, where barely four hundred were on the ground. What conduct can be more reprehensible? Factors who lend themselves to this delusion, not only bring disgrace upon themselves but upon the owners of the land. Moreover, such conduct is calculated to depreciate rather than enhance the value of sporting grounds. There are few things more annoying to gentlemen than to start from their shooting-boxes, to roam over wild mountains and glens in quest of grouse and to return home wearied and disappointed.

How different the sporting in the olden time, when the neighbouring lairds were wont to meet on the moors to enjoy each other's society for the season, and to decide bets of rumps and dozens, to be discussed when days got short, and nights got long! There was nothing heard of grouse disease then, and sportsmen could always count on a good head of game on the hill. In our native county, Ross-shire, proprietors and their friends occupied shootings, and

particularly those of Keanloch Ewe, Achnashean, Strathvaich, Leadgoun, Inchbea, Achnacluach, and Fascrinach, dispensing hospitality extensively in their bothies of a but and a ben, with the addition of a sweet-scented hay barn, that knew neither lock nor key! In the latter place, under the black rafters, which have long since gone to ashes, the varied produce of Ben Derg and Ben Cailich, and of the black linn of the romantic Broom, was annually enjoyed by large parties, who luxuriated amidst the sweet intercourse of friendship unrestrained; and in autumn Loch Broom is truly beautiful. For a time there was a lull in deer-stalking, but grouse shooting in perfection prevailed; and it is now nearly sixty years since a very interesting bet was decided in Strathvaich, betwixt the late Sir Francis Mackenzie of Gairloch, and Mr. George Mackenzie of Allangrange, two crack shots of uncommon pluck; and though they only took the hill after a very late breakfast, the former killed sixty-nine, and the latter seventy-three brace of birds, showing the abundance of game in these days. The loss of the bet was a gain to a party of at least a dozen, who met at the good old town of Dingwall to celebrate the event. Such meetings, so unselfish in character, when friend vied with friend in promoting manly sport and social virtue, are not now, alas! the order of the day. To many Highland patriarchs, the very thought of having out-lived the chivalrous convivial men

of those days, who so generously met to perpetuate friendship, makes life "a moral desert and a blank."

The sporting element in the rising generation is, we are sorry to observe, at a rather low ebb. Professor Blackie sarcastically said of our Highland sports, that—

London brewers shoot the grouse,
And lordlings shoot the deer.

We fear there is some truth in the satire, for by far too many of the shooters of the present day would cut but a sorry figure if they were not led up to the game. It is indeed a sad thing to see the old English and Scottish love for the sport degenerating into the spiritless diversion of battue shooting.

Murder most foul, as in the best it is ;
But this most foul, strange, and unnatural.

It is like walking into a poultry-yard and shooting tame birds in cold blood. It is quite a misnomer to call such wholesale slaughter of game "sport." To our mind battues are the most insipid pastime imaginable, indulged in for the vulgar ambition of topping the list of killed in the Gazette of Fashion. Genuine sportsmen have it in their power to discourage, by their social influence, such shameful butchery, and we trust they will exercise it against one of fashion's false freaks. To blaze away at flocks of game, with a couple of loaders at one's side, is altogether

unsportsmanlike, and should be more and more condemned by the lovers of true sport.

If Nature bids

To kill or eat,—the life-destroying steel
He edges with compassion. He, the friend
And guardian, not the tyrant of whate'er
Inhales the vital breeze, ne'er issues forth
Breathing dismay and slaughter in the paths
Where happy creatures sport.

Lockhart, in his "Life of Sir Walter Scott," talks of a lad fresh from college, who had no other idea in his head than his gun and his pointer. But Lockhart was no sportsman. Sir Walter certainly was, and no one knew better than he did that the man who had no other idea in his head than about his gun or his pointer, was quite as unfit to be a sportsman, in the proper sense of the term, as a man of letters. What Disraeli says in "Lothair" of the Aryan race is not inapplicable to the thorough sportsman. He may be no bookworm; it may be neither his custom nor wish "painfully to pore upon a book;" but the want of great knowledge of books does not necessarily imply ignorance. Southey finely expresses that sentiment:—

One impulse from a vernal wood
Will teach you more of man—
Of moral evil and of good—
Than all the sages can.
How sweet the love which Nature brings!
Man's meddling intellect
Perverts the beauteous forms of things:
We murder to dissect.

Well; the sportsman may not be a worshipper of nature, but he must be an ardent lover of nature. Shelley has the following beautiful lines:—

Away, away, from men and towns
To the wild woods and the downs;
To the silent wilderness—
Where the soul need not suppress
Its rapture, lest it should not find
An echo in another's mind.

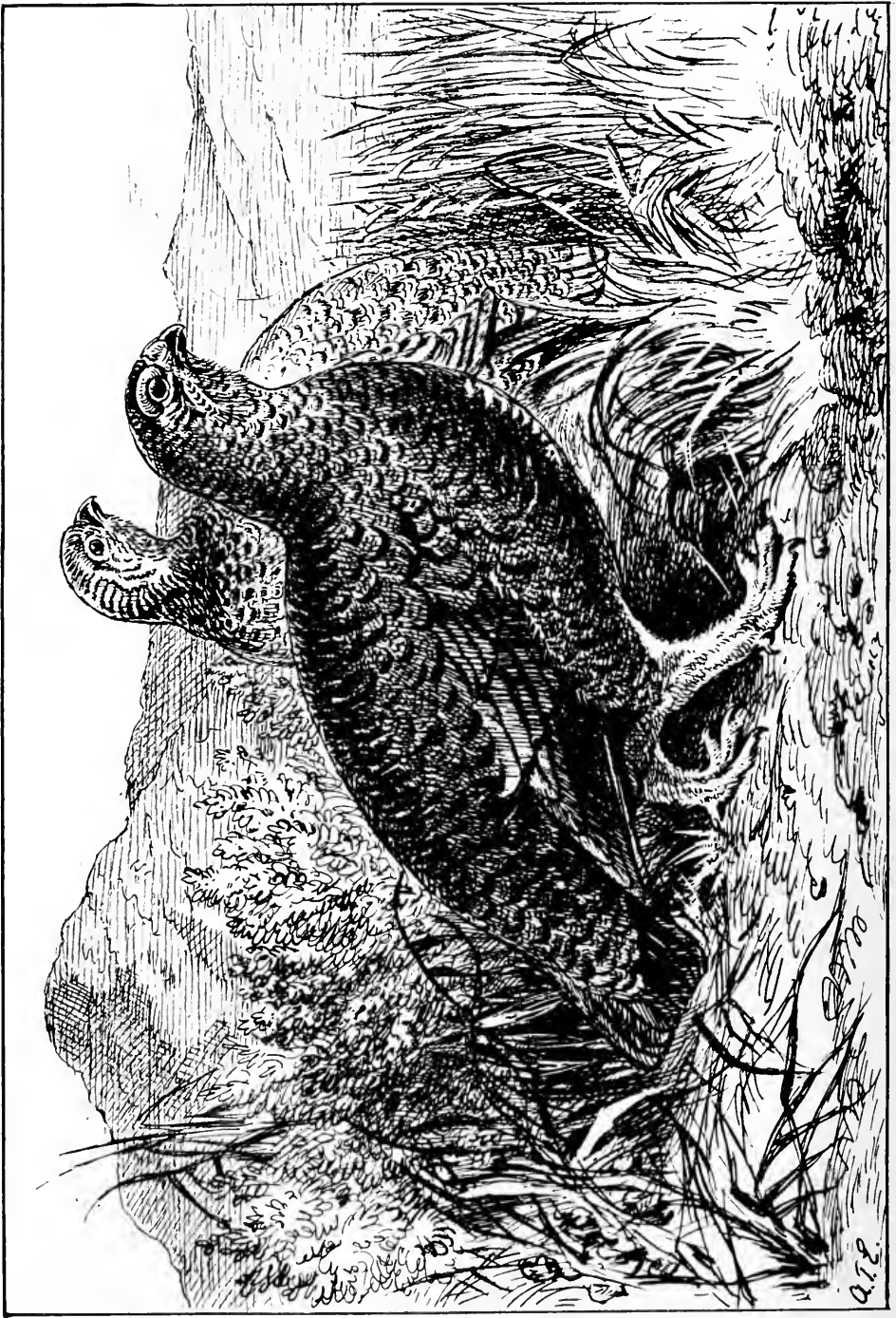
Grouse-shooting and deer-stalking have become a passion with Englishmen who can afford the sport—a passion which vents itself very pleasingly into the coffers of Highland lairds. To them, it is indeed the Golden Age. They have no difficulty in inducing their many friends to cross the border to share in the sport and pleasures of the land of the mountain and the flood; because Englishmen, like themselves, delight to scramble over the rugged mountain-top, and tread the flowery heathered hills and glens in search of game. They, too, delight in seeing the beauties of nature in reality, knowing that art, glorious as it is—the most beautiful and perfect picture—can but faintly imitate nature. They also feel that there are few periods in the life of sportsmen more exhilarating than when they find themselves, in the freshness of the morning, on the dewy moors with dogs, guns, and gillies, ready for shooting grouse and blackcock on whirring wing.

Migration to the Highlands and the moors is more

fashionable than ever, and there seems little probability at present that the attraction will soon pall. The wealthy class who delight in the hills and valleys, streams, lakes, and purple heather appear year by year to augment the number. We deem grouse-shooting and deer-stalking the instinctive exercise of one of the valuable and noble attributes of man. They call into action sagacity, activity, caution ; besides patience and perseverance, endurance and strategy. Moreover, such sport is not only a healthy and invigorating recreation, but it affords favourable opportunities for inviting friends to enjoy unceremonious hospitalities at "The Lodge." Some of our pleasantest memories are of the convivialities at shooting-boxes, with their unostentatious liberality—

Come then where the heather bell,
Child of the highland dell,
Breathes its coy fragrance o'er moorland and lea ;
Gaily the fountain sheen
Leaps from the mountain green :
Come to our highland home, blithesome and free !





RED GROUSE.

CHAPTER II.

The red grouse is scattering
 Dews from his golden wing,
 Gemmed with the radiance that heralds the day :
 Peace in our highland vales,
 Health in our mountain gales ;
 Who would not hie to the moorlands away ?

THE red grouse, or *Lagopus scoticus*, is the most beautiful and most popular game-bird, and is more sought after than any of the other varieties. He certainly well deserves all the care we can bestow upon him, while his presence on our hills affords healthful and legitimate sport. Even matters of State are often hurried through, or postponed to another season, that the votaries of the trigger may enjoy for a time their favourite sport. As the 12th of August approaches Members of Parliament begin to think that grouse-shooting is paramount to all legislative questions, and betake themselves to moors to invigorate themselves after long, wearisome nights spent in debate. The comparative abundance or

scarcity of the heath-frequenting birds is a matter of concern, not alone to sportsmen, but to the landowner who calculates on getting a guinea a brace for all the grouse his moors will produce, and thirty pounds per stag for forest lands.

Grouse are found only on moors, as they feed almost entirely on heather and wild grass seeds, the tender tops of the heath being their chief food. Hence the necessity of moor-lands being properly managed by keeping the evergreen shrub in sound condition. It is penny wise and pound foolish not to keep moors in as sound a state as possible, especially where the rearing ranges are high above the level of the sea. The principal means of effecting this is to judiciously drain the wet land and burn the old heather. Periodical heath-burning is absolutely essential to the well-being of grouse. Yet many gamekeepers are prejudiced against it. We are persuaded that the diminution of grouse by disease is in a great measure attributable to neglecting to burn the old heath. Grouse never hatch in long heather if they can avoid it, nor do they lie in it. Nests are rarely found in heather of more than a foot in length. When made close to rank heath, the young birds eat the decayed fibres and die of indigestion. They are liable, also, to disease from the damp, unhealthy position when they leave the nest.

Heather of a moderate growth affords better shelter

to young broods than when old and high ; because the old is invariably bare and thin, except at the top, and the young birds are thus more exposed to cold and damp. The happiest condition in which a nest can be found is in growing heather of about a foot in length, and in the immediate proximity of short young heather. When the heath is rank the young birds are caged in—are unable to rove about for food, and are often found dead in their nests.

Sportsmen are apt to be misled by the fact that, when out shooting, they usually find grouse in thick cover. This is easily accounted for. Birds always run into the best shelter on the first alarm given by the distant shot. They have an instinctive dread of the gun. To secure the most favourable condition of heath for grouse it must be burnt by rotation, a certain portion every year, so as to have at all times heather of good sound quality and of the stages of growth best suited for food and cover. The extent to be fired each year should, of course, be regulated by the nature and quality of the land, as regards its capability of yielding the shrub, as there is a surprising difference in the growth of the crop in various soils.

If the heath grows rapidly it requires to be burnt more frequently to prevent its getting rank. Where it grows slowly burning should be less frequent. Opinions differ as to the proportion that should be burnt each successive year. We think that from a

sixth to a tenth of the whole extent is best. In numerous cases the proportion can hardly be less than a tenth without running the risk of allowing the heather to grow so long as to be injurious to the grouse. Burning is the cheapest mode of keeping a fresh supply of young heath. But where there is danger of the fire extending beyond certain defined limits, the best way is to cut or mow patches here and there on the most sheltered and sunny slopes, where the broods can feed and lie in comfort and warmth, as damp and cold never fail to produce diarrhœa, cramp, and disease.

One of the causes, then, of grouse disease is neglecting to sufficiently burn or mow extensive patches of the old rank heather in the best feeding-grounds, so as to ensure an adequate supply of tender heath-shoots for food, and cover for protection in winter and the breeding season. Old rank heather and decayed fibres lack the nutrition requisite for the healthy condition of the grouse, and are not duly assimilated in the system of the bird ; disease of the liver results, of which they speedily die. We have often conversed with the aborigines of North America, who are excellent ornithologists, as to the cause of the disease, and they quite agree with our views. When there is not a sufficiency of young heather for the grouse to feed upon they will take to other food that does not agree with them. This, of course, is a fertile source of disease.

In the evidence given before the Select Committee appointed in 1873 to consider the Game Laws of the United Kingdom, we find that several gentlemen of position and experience have expressed their views on heather-burning. Mr. David Mundell, an extensive sheep farmer in Inverness-shire and Ross-shire, replies to the question—Can you give any instances where heather-burning has been beneficial to game?

“Yes, plenty; the strongest instance that I can give is this: when grouse were very scarce in the Highlands, when I was young, my father burnt the heather, after coming into the county, on the hill of Knockdamph in Rhidorroch Forest, in Ross-shire.

“If heather be burnt, is it a fact that all the sheep in the neighbourhood rush to the burnt heather?—Before burning his hill you would see but an old bird, or a very few, just one here and there, and most of them old cocks; but the next year after the burning there were hundreds and hundreds of them that came from all the neighbourhood round into that ground. We had a neighbour, a farmer, whose sheep came on to the ground, and he said he did not like his neighbour who burnt the heather, because it took away all his neighbour's sheep.

“So that it is a fact that not only the grouse, but all the sheep, near heather-burnt ground, rushed to it?—Yes; if once two or three sheep find it they bring others; they all rush to it.

“Are you prohibited from burning on your present farm?—No; I am prohibited to one-seventh part, which is quite sufficient.

“Can you speak personally that the grouse have increased since you took your own farm?—Yes, they have increased greatly since I took the farm. There is a very good stock of grouse.

“Do you attribute that to the heather-burning?—Quite so.

“Do grouse breed among long, rough heather?—Never. I have been amongst the hills all my life, and I have never seen a bird’s nest amongst the rough heather. They build in a little tuft of heather at the side, or even among the bent. No man ever saw them build in the rough heather.”

Mr. Thomas Purves, of Caithness and Sutherlandshire, interrogated:—

“What have you to say about the burning of the moors, that we hear a great deal about?—It was principally the everlasting contention and the everlasting trouble about burning the moors which made me first apply to my proprietor for the shooting. Gamekeepers are generally averse to the burning of moors, and I am sorry to say their employers are too often guided by them. I may mention that the season before I took the shootings I saw a letter with the local factor from the sporting tenant stating, as a complaint, that it was of no use he and his friends coming up to shoot over my ground that

season, because I and my servants had so over-burned the ground. That season there were nearly double the birds shot on that ground that were ever shot before.

“Did you ever know a keeper that knew anything about it, that does not wish the heather burnt when it got to a certain growth?—I know a great many who know very little about it.

“Is it not in the interest of the shooting tenant that the heather should be burnt periodically, but burnt in patches?—Yes; and it is the interest of the sheep tenant as well.

“If the heather is burnt in patches it suits both the shooting tenant and the sheep farmer?—Yes.

“But the shepherds who are careless will burn a whole hill-side, will they not, and leave it bare?—I should explain that we are now by Act of Parliament compelled to burn all our heather by the 26th of April, but we only get leave to the 12th of April without the consent of the proprietor, and we are very often hampered in getting it done. It is perfectly well known to every practical man that, in the wet flocs, as we call them, the flat ground cannot be burnt in one year out of ten by the 12th of April; I have often known the last day or two of the burning to be the only two days in the whole year when we could burn. Our shepherds are always a very limited number compared to the extent of ground to be burnt; those men go out to burn with no intention of doing

any harm, but they must do a certain amount of work at a certain time, and they light the fires here, there, and everywhere ; one cannot control those fires ; there is no power ; they have to do it upon a very dry day, and instead of the sportsman giving us the assistance which he should do by his keepers, I have generally found that the keepers take no interest in the matter, but they complain against us after it is done.

“Is it not the case that, if a keeper knows his business, he will favour the burning of heather, provided that it is burnt in patches ?—Certainly.

“And will give assistance in doing it ?—He ought to do it.

“You yourself practically, since you have had the shooting in your own hands, have had no difficulty, I presume, in burning the heather ?—I have suffered far more loss from the burning of heather than the sportsmen have ; in fact, I burn extensively, and the birds have been doubled on that land since I have had the shooting. My ground being low, at the end of the season they come down in very great numbers from the higher ground to my ground.

“And the birds are very fond of feeding on the young shoots of heather after it is burnt, are they not ?—They eat nothing else.

“And if it is burnt properly, it is exactly what is in the interest of the sportsmen ?—Perfectly so.

“Has the quantity of game on your farm been seriously diminished since you took the shooting your-

self?—No; we get more birds than they got before, owing to the ground being properly burnt.”

Yet many gamekeepers object to burning the moors, even in small patches. Their repugnance must be ascribed to old prejudices and old opinions. They are sticklers for old routine, regarding any new light as an innovation of pretentious theorists, although they cannot but know that when grouse are flushed they almost invariably make for the nearest patch of young heather, the fresh tops of which constitute their food. Unlike ground game, they subsist upon shoots and seeds of indigenous plants, which must be young and in abundance to ensure the good condition of the birds.

Mr. W. Houstoun, of Kintradwell, Sutherlandshire, states, in his excellent brochure on “Heather Burning,” that “it is sometimes easier to find a complaint than suggest a remedy; but there are two axioms which we think must be admitted to commence with; the one is, ‘That you might as well let arable land to a man, and bind him down not to crop it, as let hill grazings to a sheep farmer and prevent his burning heather;’ and the other is, ‘You might as well let a shooting to a man, with a proviso that he was not to use a gun, as ask him to pay rent for ground upon which all cover and long heather had been burnt.’ Nevertheless, the interests of the sporting and farming tenants are more identified than the feelings which so often exist might lead one to suppose, as there cannot

be a doubt that a regular rotation of burning in stripes and patches is absolutely necessary for the healthy maintenance of sheep, deer, and grouse.

“If, then, it be admitted that judicious heather-burning is for the welfare of both parties concerned, it will at once appear plainly that the only effectual mode is for them to co-operate and each contribute a quota of expense to enable the thing to be systematically carried out. What are the respective proportions to be contributed by landlords or tenants towards this end is not our province to decide; but we may remark that, whereas of old shooting rents were very low when compared with those paid by farmers—and the latter, with perhaps a little reason if not much philosophy, considered that the sympathy and protection of the landlord should lean towards the person paying the higher rent, and whose whole capital, upon which his living depended, was invested—it now happens that shootings have risen so much in value that in very many cases they come up to or exceed the sums paid for grazings. Here, then, we have, in one particular at least, and that a very important one, the two tenants upon an equality, and having a like claim upon the even-handed justice of the proprietor. How this is to be dispensed to the satisfaction of either party, under the fast and loose system of burning generally in vogue, we leave for wiser heads to unravel; but from a long experience of its unpleasant working, during which we have not

unfrequently stood in the place of the responsible culprit for a servant's misdeeds in over-burning, we have at the end of the day come most firmly to the conclusion that nothing short of a regular assessment upon landlord, sportsman, and farmer, to such an extent as will enable a staff of men to be put on to each hill district during the burning season, can ever prove an effectual remedy. Armed with brooms, and under proper superintendence, the duty of these extra hands would be to curtail and guide the burning into strips—a certain portion being done annually.

“ Writing from an intermediate county, it may not be invidious to mention what we believe to approach the proper system of moor-burning in Caithness and Ross—and both, by the way, on ducal estates. In the former case the ground is burnt in rotation with the regularity of a dice-board, and is quite charming to look upon; and no less charming is it to hear that, in the latter county, a concord exists between sportsman and farmer, which the judicious factor accounts for under his short but most comprehensible rule, that ‘The farmer lights the fire and the sportsman puts it out.’ ”

Looking at the many instances of mismanaged moors, we might, indeed, suppose the idea that heather possesses a mysterious indistinctive vitality prevails amongst landowners and sportsmen. It is true that the heaths, the natural herbage of this description of land, require for their growth but little

from the hand of man. Being the food of all herbivorous animals in a state of nature, these plants are endowed with sufficient means of preserving the fertility of the soil on which they grow, but have no natural provision to meet the increased demands upon them consequent on the grazing of sheep and cattle. Heather and other wild plants possess the power of obtaining much of the nitrogen they require from atmospheric sources; at the same time they are greatly benefited by periodical burning, which supplies the roots with vegetable elements of nutrition. We have the high authority of Sir Humphrey Davy for stating that the alkalies produced from the combustion of plants tend very powerfully to promote the growth of new herbage; and that the burning of such plants as heath, furze, tough grasses, rushes, and moss, is the cheapest and best means of reducing such substances to a state of minute carbonaceous particles, at once capable of supplying food to the roots of new plants. It is an error to suppose that burning the heather covering of the land so consumes the soil and the roots that succeeding crops fail to attain perfection. The reverse is the case. Another good result is the destruction of grubs and insects.

It is well known that when we get to the watershed of Scotland, where the water begins to flow to the Atlantic on the one side, and to the German Ocean on the other, as we advance to the Atlantic the grouse shooting deteriorates. This is owing to the great

quantity of rain that falls over the western division of the country, which drowns the young birds. Moreover, the hills on the west coast produce more grass than heather, so that there is a scarcity of food for grouse. The valleys and glens, too, are subject to fogs. But there are some modifying circumstances. If there be much rain, there is also much sunshine. And if the spring be wet the winter is mild, and the first signs of vegetation appear earlier than on the eastern side of the country.

Now that grouse land is so limited and overcrowded it is capable of being greatly improved, where marshy, by drainage. When water collects in pools upon the moor, and when it is spongy from superabundant moisture, evaporation goes on rendering the air unhealthy and the soil cold. Some of the ailments of grouse disappear before the influence of drainage, which often produces as great an effect upon the atmosphere as on the soil. It clears the soil from the growth of many noxious substances which wet breeds in it. For every tissue of vegetable life is formed of innumerable vessels from the soil. Just as drainage is the corner stone of farming—the foundation of agricultural improvement—so it is with moors, which deteriorate by superfluous moisture. The temperature of hill pasture is raised by drainage. During sudden falls of temperature, and during protracted cold periods, as when the surface is under snow, the cold finds its way sooner and more com-

pletely through undrained than through drained land. When the temperature of the air is higher than that of the land, the moor receives more benefit from the higher temperature than undrained land, since it is more easily permeated by the air.

Many moors incapable of conversion into arable land might be much improved for sheep and grouse at little expense by drainage. When the health of this valuable stock is taken into account such melioration soon repays the outlay. We know an instance in which wild heath land was increased fourfold by drainage alone. Black leg and red water are some of the fatal diseases which arise from animals grazing on peaty, swampy pastures. Surely then we may conclude that feeding grouse in similar circumstances is one of the causes of the disease which periodically attacks them. Excess of moisture impoverishes the heath and makes it unhealthy for birds to feed upon. Surface drains should be cut with a gentle slope so as not to endanger the young grouse.

We are aware that hill-drainage has fallen into disrepute with some shooters because they have been disappointed in the results. Why? Because they acted upon the absurd theory that all lands can be drained alike regardless of their various qualities. Because they disregarded the laws that govern the natural drainage of a country, and laid out a system utterly opposed to nature, instead of being guided by her laws. In drainage operations the great point is

that they be well planned and efficiently executed. Nothing can be more penny wise and pound foolish than, after the opinion of an experienced engineer has been obtained, to entrust the work to ordinary labourers, by whom, ten to one, it will be bungled.

The stock of grouse might be much improved by new strains of blood. The Duke of Hamilton's experiments in this way proved very successful. His Grace had several brace transferred from the moors of Lancashire to the Island of Arran, which resulted in a wonderful improvement in the breed. We are aware that the greatest good has been effected in various birds by crossing. Just as seeds flourish best if changed every few years, so birds and animals must be crossed now and then to maintain their vigour and full development. This is a simple law of nature which ought not to be neglected, especially in over-preserved, over-stocked moors. If not attended to animals and birds will assuredly degenerate. Size is reduced and symptoms of delicacy of constitution become manifest, the same as in the human race, who, by intermarrying, when too closely related, weaken their physical vigour. When breeding cattle and sheep we invariably found that breeding in-and-in from stock having bad qualities resulted in ruin to our herds and flocks.

We know by long experience that with farm poultry, the introduction of new blood enhances the weight and value of the birds. The game-cock

among domestic fowls is like the short-horn bull among cattle, the fleet greyhound of the chase, the blood-horse of the race-course, and the high-bred Spanish pointer of the kennel. Mr. J. H. Walsh (“Stonehenge”), Editor of the “Field,” gives the following illustration of the evils of in-and-in breeding in his admirable work on “British Rural Sports”: —“Great injury has often been done by breeding in-and-in for many generations of pointers. A sportsman begins life by obtaining a brace which do their work to perfection, and he is the admiration and envy of all his sporting friends as long as they last, which may be perhaps five or six years. From these he breeds others, which also maintain his fame; and he expects to be able to continue this plan with the same blood for fifty, or, in some cases, sixty years. He is so wedded to it that he fears any admixture, and for two or three litters he does not require it; but at last he finds that though his puppies are easily broken to stand and back, they are small, delicate, and easily knocked up, and are mere playthings in the field. This I have known occur in several kennels of pointers, in one of which the blood had never been crossed for seventy years; and though the boast of the owner, that they required no breaking, was founded in truth, yet they did no more than back other dogs, for they rarely found game after the first hour’s work, being by that time wholly knocked up.”

There is no difficulty in transferring grouse from

one moor to another, as they are easily netted. The keeper has but to take correct bearings of the spot where the birds have settled and drop his net over the spot. In this way the Prince of Wales has had several brace of grouse transported from Aberdeenshire to His Royal Highness's Sandringham estate in Norfolk. The birds reached their destination safe and sound and fought the battle of life bravely through the winter. We traversed Wolferton moor, but found the surroundings unfavourable for such birds, being nearly all either cultivated land or scrubby marsh. We expressed our views at the time that the moor is much too limited for the long flights natural to grouse, and not wild nor hilly enough for them to take to kindly and flourish. The heath itself looks all that can be desired as a habitat for grouse, but so small in extent that they wandered away and were shot and trapped, much to the disgrace of the small freeholders, seeing that his Royal Highness had gone to so much trouble in making a most interesting experiment. The trial, however, was useful as proving that grouse can be removed from one place to another without regard to distance.

An easy way of improving grouse, by introducing new strains of blood, is by exchanging their eggs. When we had the shootings of Ferrintosh we adopted this means on the Mulbuy moor with complete success. We took the eggs from one nest and transported them to another a distance of twenty miles. Incuba-

tion was not in the least prejudiced, and several fine strong broods were the result. Eggs selected for substitution should, of course, be removed as soon as possible, and they should be chosen of a large size, avoiding those of equal thickness at the ends, which usually contain a double yolk and become useless. Grouse, like most wild birds, are very capricious as regards sitting, so that care must be taken not to scare them when effecting the change. A common hen of moderate size will hatch grouse very well; but the bantam is the best hatcher and rears them in better feather. Heath-game reared in this way take well to the moors, are free from disease, and do not differ in any respect from wild-bred birds. As grouse floor their nests with a few blades of grass in cavities, at the base of heather tufts, and lay their eggs on the top, there is no difficulty whatever in getting their eggs for transfer from one Highland district to another. In olden times, when grouse had wide ranges of moorland, the breeding went on all right; but now it is different, through the advance of agricultural reclamation.

A great and growing evil in the management of moors is the erection of miles upon miles of wire-fences, especially when made entirely of iron. Grouse in their flight do not always see them, and are killed in great numbers. A gentleman writing from Roxburghshire in the "Field" of last September, states that he has known as many as seven cut to pieces out

of a flock of eleven. Old birds come to know them, but young ones run against them and are killed. In some districts as much as thirty to forty per cent. of the grouse that are hatched are thus destroyed. It is suggested that on all wire-fences with wooden stakes the proprietor should place a bar of paling along the top; and on those made entirely of iron, pieces of tin be attached to the top wire. On most hill-land a boundary-fence of some sort is indispensable to prevent the intrusion of sheep and cattle into deer-forests and neighbouring farms.

There are great varieties of fences: stone-dykes, turf-dykes, sheep-hurdles, post-and-rails, wooden palings, and wire-fences. The best fence against sheep and cattle, and the most suitable on grouse-moors, is the old-fashioned stone-dyke from three to four feet high, with a cope of a foot to sixteen inches; and at intervals of six or seven feet one cope-stone of about two feet high, having a niche in which a strong rail is placed. This kind of inclosure is the cheapest in the end, and grouse never fly against it.

As we have said, grouse feed, almost exclusively, upon the top shoots of heather, and it is best for them when young and tender. When the heath is in this favourable condition the birds are in general healthy; but when the heather is old, and affected by severe frost, or a wet season, the contrary is the case; they become weakly and diseased. We think there cannot be any doubt that there is an inseparable connection

between healthy heather and healthy grouse. A Scotch forester states that all along the sea-coast, where the heather does not suffer by frost, there is no grouse disease; while inland, ten miles or so, beyond where the sea exercises its influence, there the grouse disease begins. The dissection of grouse that have died of disease has proved that their crops contained frost-bitten heather. We can also connect the disease with wet seasons. The heath, like other vegetable products does not quite ripen, particularly the small tops on which grouse chiefly feed. The tape-worm, so common in diseased birds, is equally the result of a wet open season as of frosted heather. Of course, bad hatching seasons, such as cold wet weather, have unfavourable results, but these are unfortunately beyond human control. We can, however, mitigate the evil effects by drainage, and burning the heather periodically, so as to give sound, healthy feed. We find that excessively cold or wet seasons are succeeded by great mortality among birds, and that grouse suffer more in wet than in dry seasons however cold. This was strikingly demonstrated in the wet season of 1872-73.

The tears of heaven shed o'er much
Doth infinite mischief.

CHAPTER III.

He prayeth best who loveth best
All creatures great and small ;
For the great God, who loveth us,
He made and loves them all.

ANOTHER cause of grouse disease is over-trapping of birds and beasts of prey, which interferes with the balance of nature. Birds of prey especially contribute to the soundness of breed by destroying the weak and sickly grouse, such as become debilitated from bad feeding, want of good water, wet, and cold. There is thus left, though a smaller, yet a stronger, hardier, and healthier stock. Surely it is not without reason that nation after nation are making laws for the protection of wild birds. There must be a growing feeling of the necessity. Just as we believe that in farming birds are absolutely required to destroy weeds, grubs, and insects, so we believe birds of prey to be necessary for ensuring a well-stocked moor of healthy grouse.

There can be no doubt that were the "Balance of

Nature " left to herself all would be right. The Rev. F. O. Morris, the Rev. Mr. Tristram, Mr. R. Gray, all well-known naturalists, and others, are most anxious to protect birds of prey, believing that they should hold their place in the divine organization of nature, and that no bird on earth would be a nuisance if man had not interfered with them. Lord Lilford, who is a sportsman of the first rank, believes in this balance in nature, for his lordship said: " My view is, if we allowed the hawks to increase, and take their share of the small birds, we should get about the right balance."

But cawing rooks, and kites that swim sublime
In still repeated circles, screaming loud ;
The jay, the pie, and even the boding owl
That hails the rising moon, have charms for me.

Whilst we think that birds of prey should be allowed to increase, we think that grouse should have improved conditions of existence.

Keepers, as a rule, look upon everything as vermin, except what they find in the game list, and kill off accordingly, with a "zeal not according to knowledge." This certainly is one of the causes of the grouse disease, and is an erroneous and ignorant practice. No doubt birds of the hawk tribe sometimes kill grouse of full vital energy ; but they destroy more of the weak and sickly, and thus prevent the outbreak of epidemic. Moreover, great numbers of wounded grouse, if not destroyed by birds of prey, would live

to rear a sickly brood, which would become diseased and succumb to the malady.

Birds and beasts of prey have become almost extinct in the Highlands. There is, however, a healthy feeling growing, that at least eagles and hawks should not be killed. The Duke of Sutherland, Mr. Cunliffe Brooks, and some others, are now preserving these birds in their extensive shooting ranges. Mr. John Colquhoun of Omara House, writes on 5th August:—“In my late correspondence about ‘The Hunters’ Badge’ in the ‘Field,’ I mentioned that a golden eagle had hatched close to a shooting-lodge, where my son and his friend, the shooting tenant, saw the pair most days they were shooting, followed by their eaglet about ten yards behind them. The old birds were evidently teaching the young one to hunt and kill prey. Soon after the sportsmen left for the winter one of the keepers trapped the old male by mistake. The widow and young one soon afterwards disappeared, but the former returned again last spring with another male, hatching in a new eyrie twenty yards off, where a second ‘hopeful’ is nearly ready to be taught to provide for himself.” Some well-meaning, but unwise individuals, set up the plea of cruelty to the grouse as a reason for destroying hawks. They say that it is horrible to allow poor defenceless birds to be torn to pieces by their enemies, and die a lingering death. They hardly know what they talk about. When hawks overtake their prey on the wing, they strike

them dead at once with the powerful hind-talon. It is as sudden a death as that of a pheasant shot clean. They make light of the poor hawk caught in a trap, to linger for days and nights in indescribable torture, until it pleases the trapper to release it from agony by giving it the *coup de grace* when upon his periodical rounds. The spring-teeth trap is the most barbarous and cowardly of killing instruments against which the voice of humanity has been long raised.

We have two sorts of eagles—the golden eagle and the sea eagle, both magnificent birds. Who has beheld their aërial evolutions without admiration and surprise, as they majestically swoop upon their quarry! We have several kinds of hawks—the buzzard, the hen-harrier, the peregrine falcon, the sparrow-hawk, the goshawk, the merlin, and the kestrel, all filling an important place in the economy of Nature. Of beasts of prey we have but few, and they are fast disappearing. There is the mountain fox, the pole-cat, the marten-cat, the stoat, the weasel, and the rat, and a few others exceedingly rare. We certainly think the instrumentality of birds and beasts of prey beneficial, and that it is decidedly wrong to interfere with the balance of nature.

Accuse not Nature, she hath done her part ;
Do thou but thine.

Our experience and observation are strongly in favour of the feathered tribes. Just as we are indebted to certain birds for their protection of cereals, roots,

and fruits from destructive insects and blight, and of the soil from slugs and grubs, are we equally so to birds of prey for the part they take in the preservation of a healthy stock of grouse. We know that fruits, roots, and seeds are eaten by certain species of birds. The starling takes the cherries, the blackbird and the thrush the strawberries, the rook and the sparrow the wheat, the pigeon the barley and the pease, and so on; but then we ought not to overlook the fact that, if these birds were annihilated, small indeed would be the quantity of cereals, roots, or fruit that would arrive at maturity.

We know districts where "bird-murder" had been carried on to such an extent that there were scarcely any to be seen. Farmers and gardeners were, however, speedily made alive to the truth that grubs and slugs, which, in the varied stages of their changeful existence, form the chief food of birds, are a hundred-fold more destructive to cereals, roots, and fruits, than our pretty plumed bipeds. We have invariably found that in farms and gardens where birds were systematically shot, trapped, and destroyed by poison, and other means, a corresponding loss of produce from the ravages of insects was the result. It is in like manner detrimental to grouse-moors to exterminate birds of prey, as we shall presently show. It is only the short-sighted who dispute their claims to toleration in return for the benefits they undoubtedly confer upon us.

Some observations on the Balance of Nature which

appear in the "Field" of the 26th of August last are so good, and from so high an authority, that we are tempted to reprint the article in support of our views.

It seems strange, in these days of wild birds' protection by statute, to read from certain districts reports "of the successes during the past season of local sparrow and rook clubs. It is not as if the political bias of those who organise these societies was of an opposite tendency to that of persons who supported measures for the protection of wild birds in the breeding season. The views of the farmer are, as a rule, in a Conservative direction, and so are also the Acts just alluded to. Fifty years ago the farmer was even more Conservative than he now is, and yet he in those days was keen to wage war against the rook and sparrow, as the reputed natural enemies of his calling. It is almost needless to state that the researches of naturalists have long ago exposed the fallacy of supposing that either rooks or sparrows do damage to the farmer at all commensurate with one-tenth of the benefit they confer on him, by preying upon insects and caterpillars during the period when crops are not in a state to invite their attack. Practical experience and experiment have proved over and over again that, in districts where certain species of birds have been exterminated, the crops have suffered to a far larger extent from the attacks of insects; and though in harvest season they may have been freer

from depredations of birds, the amount of produce that has been destroyed by beetle and caterpillar is much greater than any which would have been plundered by the birds. They lived first to protect the crops in their growth, and afterwards to eat of the fruits of their labours. The fallacy of supposing that destruction of such birds meant protection of crops, was a natural one for the bucolic mind to entertain in the first instance; but in the face of later recorded experiences, and of the march of education, it might have been supposed that agriculturists *en masse* would, in this country, have recanted their error, and have been only too glad to encourage their own protectors. And yet we read in more than one local journal of the proceedings of these clubs, the reports by their secretaries of the result of the operations of slaughter during the past year, and self-gratulation on the results.

“The reason why the rook is looked upon with suspicion by farmers is on account of his operations on young wheat, and the ocular evidence that he digs up a certain number of young plants where at work on a field of this sort. It is naturally assumed that he is operating as a depredator. A little careful examination of the plants which he has uprooted will show that each has been attacked by the wireworm, or by some other larvæ, and that these, and not the wheat plant, have been the object of the rook’s search. It is evident that he selects his plants, and

that he does not uproot one patch in entirety before proceeding to another part of the field. This fact alone might suggest that his motive was something different from a direct attack on the wheat itself; but if it required further confirmation it will be found in examination of the uprooted plants, and still more, if he is scared away just as he has turned up one plant, and that is at once inspected, the actual wire-worm may be found, for which the rook has been searching. Similar evidence of the benefit of the rook's operations may be found in a turnip field, especially when the turnip plant is young. The sparrow does not disclose such palpable evidences of useful work, but his value, like that of many another blessing, is best appreciated when he is absent from the district, and when, in place of him, all sorts of insect pests prey upon the crops. That both rook and sparrow should, during the week or two when grain is ripening, be tempted to prey upon it, is intelligible; but the cost of "lenting" a ripening corn field is very small, compared to the loss of crop which ensues when the protection of these birds is removed for the whole of the earlier part of the season. The farmer himself would be the first to deride a suggestion that sheep-dogs should be exterminated because they might now and then be tempted to help themselves to a bone, or even a joint, when the stock has been converted into mutton.

"One reason for the crusade against rooks and

sparrows being still maintained, and even revived of late, is that the wood-pigeon is really mischievous, without giving a satisfactory *quid pro quo* to the farmer. He will eat his own weight of food, over and over again, in a week, and will take it from the crops themselves for choice, rather than from the pests which prey upon them. It really pays to kill down these birds in the interests of agriculture; and the idea of a crusade against birds of some sort being once inaugurated, it becomes more difficult for the bucolic mind to discriminate in the matter of slaughter. The wood-pigeon is more of a pest than he was, because of the decimation of birds of prey, owing to game preservation. The balance of power of nature would tend to keep the wood-pigeon in due bounds; but while the same causes that protect game from feathered assailants protect also the pigeon, the latter is not annually thinned in the cause of sport, like the partridge and pheasant. He is in danger of becoming, to English agriculture, something like what the rabbit is to Australia. The latter animal was thoughtlessly introduced, without calculation that he had not in that country to contend against the same enemies, in the shape of vermin, that he has to meet in England; hence he has overgrown his quarters, and has become an actual pestilence. Even the sparrow has become a complete pest in America and Australia; but here again the same doctrine of balance, or rather of want of balance, in nature crops up. In this

country the sparrow has his own functions to perform as a consumer of smaller animal life, and to be in turn food for carnivorous birds more powerful than himself. While the two rounds of the ladder of destruction exist on each side of him, he does more good than harm; but when he is transplanted to a new country, in which no natural provision has been made either for his sustenance or his decimation, he becomes possibly an anomaly, and then demands artificial sustenance in the shape of the artificial productions of agriculture. There may be insect life which requires destruction in his new home; but if it is of a different character to that which his natural instincts have impelled him to seek, it is intelligible that, with a choice of new food before him, he may unfortunately select that which he was not intended to consume. And, in addition to this, the absence of birds of prey, such as cruelly decimate his tribe in his mother country, tends to increase his numbers, and to make him still more dependent on artificial supplies of food. The partial failure of the sparrow as an agricultural ally in America and Australia should be held as evidence, not of mischief on his part in his own mother country, but rather of that general principle of the balance of nature, which man cannot safely disturb in one department without doing himself even more injury in another. If man is prepared completely to reorganise creation in the entire scale of the chain of destruction, he may perhaps be

able to arrange it to his own satisfaction and benefit. But if he seeks to strike out one link only, or to introduce a solitary new link in a place unsuited for it, he must not be surprised if he finds in the end that his tinkering cannot compare with the organisation of Nature."

Certainly not. God created every winged fowl after his kind for good purposes. Yet man, in his presumption and ignorance, persists in disturbing the balance of nature, and suffers for it. No observant man is insensible of this fact. Many useful birds are killed, not for food, but through ignorance, thoughtlessness, and cruel selfishness. We should have thought that, in a country so enlightened, such barbarous institutions as Rook and Sparrow Clubs would be impossible. Yet landowners and farmers alike seem bent on the extermination of these birds. In Nairnshire and other counties farmers rate themselves for a fund for rook destruction, and many landlords contribute to it, notwithstanding that rooks are among the best of farmers' friends. Probably the Nairnshire farmers desire to be saved from their dark friends; but, had birds of prey been allowed to exist, rooks, pigeons, and sparrows would not be so excessively numerous.

The Earl of Cawdor, having been asked to contribute to the "Nairnshire Farmers' Association for the Destruction of Rooks and Pigeons," writes, in the *Inverness Courier*, of 31st of August last, that he read

the report of the last meeting of the Association with astonishment and regret, and declines to encourage the destruction of the "Farmers Friend." His lordship expresses his views as follows to the chairman of the Association :—

"Lochdhu, who presided, is a very good judge in most matters, but I must venture to say that I cannot think him a safe man to follow as a naturalist, and I fear that the farmers may have cause to repent the raid they have made against the rooks under his advice. Let them inquire of their Ross-shire neighbours what their experience is of a similar proceeding on their part some years ago. It would have been more satisfactory if the energetic secretary had insisted on the bodies of the rooks being handed to him instead of their heads; and if he had held three thousand *post-mortem* examinations of the crops of the birds and their contents, I should have been much surprised if he had not hurried off to Lochdhu and said that he found the birds' crops were full of wire-worms and other insects, and that grains of corn were the exception and not the rule; and that the destruction of such useful birds must be stopped at once."

This is the reply of one of the most intelligent, observant men in all the North, who is, moreover, an excellent naturalist.

The attempts made to interfere with the balance of powers as arranged and sustained by Nature are,

according to Yarrel, seldom successful. We unhesitatingly say never successful. An extensive experiment appears to have been made in agricultural districts on the Continent, the result of which has proved that farmers do wrong in destroying rooks, jays, sparrows, and other kinds of birds. In our own country, on some very large farms in Devonshire, the proprietors determined, a few summers ago, by putting a price on the heads of rooks to test the effect of their destruction; but the issue proved disastrous to the farmers, for nearly the whole of the crops failed for three successive years, and they have since been forced to import rooks to their farms. A similar experiment was made in a northern county with like results. We predict it will be so with the Nairnshire farmers. They will have to recognise these "pilferers and plunderers" as their good friends and servants, and not as "rogues and vagabonds." In like manner we consider hawks the sportsman's friends on account of their good services on the moors.

Highland gamekeepers are, as a rule, a respectable class of men, intelligent, trustworthy, and full of generous feelings; but they are instructed by the ignorant Cockney sportsmen that eagles and hawks commit dreadful ravages on grouse. Accordingly the keepers endeavour to exterminate them. Cockney sportsmen have but a superficial acquaintance with natural life. If they see a single hawk about they are instantly down upon the keepers, and tell them that

they have neglected their duty and deserve to be dismissed. The prejudice of keepers against hawks is therefore not to be wondered at, nor that they do all they can to exterminate them. Falconers and naturalists detest such would-be "sportsmen," who do not shoot for the love of sport, but for the vulgar ambition of making heavy bags by wholesale slaughter. They are simply snobs who cannot find any pleasure in studying our noble birds of prey in their true glory on the Highlands. They pride themselves in not being of those who think that birds of prey form an interesting feature of animal life and of the picturesque in nature. They see in the hawk on the mountain side, or on the cultivated plain, a mere depredator—a gloomy intruder, forgetting that raptorial birds contribute to the general health of the grouse stock by killing off the weak and sickly birds. An extensive landowner, and a sportsman of the first order, having been asked whether he preserved game with much care replied, "Yes, certainly." Being asked if he preserved birds of prey, answered with considerable emphasis, "All eagles, peregrine falcons, merlins, and other hawks, and found them his best game-keepers, as he had plenty of game on his moors and lowlands. If a man has heath land and no grouse it is his own fault."

The fault, dear Brutus, is not in our stars,
But in ourselves.

The golden eagle (*Aquila chrysaëtos*) stands at the

head of the list of birds of prey. It is truly a noble and majestic bird, of great beauty and muscular power. It inhabits the high northern mountains and cliffs, and although it is one of the most vigilant of the species, it is not nearly so great a grouse destroyer as is commonly supposed. Its food is fawns, blue hares, rabbits, rats, moles, weakly sheep, and fatally-struck deer, rock birds, gulls, crows, rooks, plovers, lapwings, &c. It sometimes carries away young lambs from farms; but it rarely takes grouse. Eagles are of great use to sportsmen in keeping down other birds of prey. They are very valuable in deer-forests in destroying the vast numbers of mountain hares that nibble the sweetest and best grasses and plants, so essential to the health and condition of the deer. Those persons who have tried to prove that eagles are most destructive to the moors have always become involved in hopeless contradictions. To say that an eagle has been seen to bring seven full-grown grouse to the eaglets in less than four hours is incredible. We feel certain that an examination of the contents of the crops of the young eagles would disprove the statement. Eagles take a grouse occasionally; but they much more than compensate in other ways for what little depredations they make upon the grouse. They do not breed so prolifically as game birds. The female lays ordinarily two eggs in the year; sometimes three, but the third is often addled. Some sentimentalists approve exterminating

the eagle, because they believe it tears to pieces its quarry in a cruel and barbarous manner, subjecting many beautiful birds to a lingering, painful death. This is a narrow and ignorant view. Eagles are by no means cruel, for they kill with a single blow of their death-dealing talons. Their strong hooked beaks are only used for ripping the carcase ; they never use them for killing their prey. What are the sufferings of the birds that are clutched by the king of birds compared with those

Of suffering, sad humanity,
And the afflicted ones who lie
Steeped to the lips in misery,
Longing, yet afraid to die ?

It measures, from the point of the beak to the extremity of the talons, three feet four or five inches ; from point to point of its wings, about eight feet ; and its weight is from fifteen to eighteen pounds. The male, which is much smaller, weighs only about twelve pounds. Its beak is much hooked, and is of a deep blue colour, the cere yellow ; the eyes large and covered by a projecting brow ; the iris is of a bright yellow ; the general colour is a rich deep golden brown, of rather a bright rust colour at the back of the head ; the quills are chocolate with white shafts ; the tail inclines to black, spotted with ash-colour. Its legs are yellow-feathered down to the toes, and are very scaly. Its claws are large and powerful, enabling it to seize the largest game. Eagles,

especially the golden, are exceedingly fond of the flesh of foxes and cats, consequently they are game preservers.

The sea-eagle, sometimes called the white-tailed eagle, is far more common than the golden eagle. It inhabits the high rocks and cliffs that overhang the sea and our great lakes. It is a fish-loving bird, and fish is its most congenial food. It also preys on aquatic birds—gulls, guillemots, puffins, etc. In short, it kills multitudes of sea-fowl on the shores of its regular hunting-beats. At times, however, it goes far for food, when fawns, lambs, hares, rabbits, wild cats, and other animals fall victims to its hunger. It is particularly fond of salmon and trout. It takes a grouse when hard up for food; but it is a more unpleasant neighbour to the farmer than to the sportsman. It feeds on carrion of any kind, delighting in venison. It is of a very roving nature, and does not return year after year to the same spot like most of the other falconidæ. It breeds in many parts of the main-land of Scotland, in the Hebrides, and in Shetland, and is more easily trapped than the golden eagle. Its young are hatched about the beginning of June, and quit the eyrie about the end of August. The evolutions of the old eagles in the air at this time are most beautiful, and their double scream is delightful to the lover of nature, and is heard at a great distance. The sea-eagle is not quite as large as the golden eagle; although it measures in length about

the same, its wings do not expand more than seven feet. Its beak is shaped like that of the golden eagle, and is of a bluish colour, irides yellow in some and bright hazel in others; strong bristly feathers hang down over its throat; the top of the head and back of the neck are dark brown, inclining to black; the feathers on the back are light brown with dark edges; the breast and belly are whitish with brown patches; the tail is dark brown; the quill-feathers are dusky, the legs are yellow, and the talons black, and more circular than those of the golden eagle. It is a great destroyer of gulls, which feed a good deal upon the eggs of game-birds; but so little is natural history understood by keepers, that they are not content with shooting and trapping these eagles, but get at the eyries on the ledges of the high rocks by means of ropes, and with match and dry heath cruelly burn the poor eaglets in the nest before the tearful eyes of the horrified, distracted parents. All for grouse, which the bird of the genus *Falco* helps to increase by killing off the rapacious nest-plunderers, the sea-gulls, the hoodie-crow, and the magpie.

High from the summit of a craggy cliff
Hung o'er the deep, such as amazing frowns
On utmost Kilda's shore, whose lonely race
Resign the setting sun to Indian worlds,
The royal eagle draws his vigorous young.
Strong pounced, and ardent with paternal fire,
Now fit to raise a kingdom of their own,

He drives them from the fort, the towering seat,
For ages of his empire ; which in peace
Unstained he holds, while many a league to sea
He wings his course, and preys in distant isles.

The common buzzard (*Buteo vulgaris*) is one of the largest kinds of hawks, and exceedingly handsome. It was at one time plentiful all over the north of Scotland, but is now becoming scarce in consequence of the war waged against it by game preservers. It is a very sluggish bird, and never chases its quarry like the true falcon. It builds its nest in old trees or upon rocks, where it watches patiently and pounces unexpectedly on its prey. Its down-edged feathers enable it to sail over the ground quite noiselessly, and thus obtain its prey unheard by its victims. It seldom soars, and is so lazy that it is glad to take a sick or wounded grouse rather than hunt the healthy. It lives a good deal on carrion, and cannot catch strong grouse or swift-winged birds of any kind. Its food mainly consists of leverets, rats, mice, shrews, moles, frogs, toads, worms, reptiles, beetles, and all kinds of insects and grubs. The buzzard is not, then, the dreadful destroyer of grouse that gamekeepers aver. Unlike many other rapacious birds it husbans eatables when satisfied, hiding them for a future time. When so engaged it utters a wild and melancholy note, which is not displeasing to the ear. It is considerably smaller than the golden eagle, being about twenty-two inches in length, and four feet six inches

in breadth. Its beak is lead-coloured, and of hooked shape. The upper feathers are dusky, and the lower pale, varied with brown. The wings are marked with bars of a darker hue, and the tail is rather grey beneath, tipped with a dusky white. The legs are of a yellow hue, and the claws black. It lays its eggs only once a year, two being the usual number; but it produces three occasionally, and rarely four. They pair in the beginning of March, and form their nests of heather, twigs, wild-grass, and wool. They are easily tamed, and have hatched broods of chickens, never eating them, even when ravenously hungry. Their great consumption of grouse is quite mythical.

The hen-harrier (*Circus cyaneus*) is no doubt destructive to game; but it, too, has redeeming qualities. It is not the sworn enemy of grouse that many keepers and sportsmen give it credit for; and its plumage is of so light a colour that the sea-gull, whose depredations are most serious as a destroyer of the eggs of game birds, is often taken for the hen-harrier.

There are few of the smaller animals that do not fall victims to this bird. Its flight is low, swift, and gliding, and very graceful. It is fond of solitude, and frequents extensive moors and glens, especially such as are covered with short brushwood and furze. Like the kestrel it has regular hunting-grounds. It makes its nest of a few slender sticks, twigs, and coarse grass, thrown loosely together under the pro-

tection of a furze-bush, and lays four or five eggs, which are hatched about the middle of June. The male and female differ much in colour and afford a conspicuous illustration of the variety of plumage in birds of the same kind but of different sex. As it roosts only on the ground it falls an easy prey to the fox and cat. It is about thirty-nine inches across the wings and about seventeen inches in length. Its bill is black; the cere and eyes yellow. The plumage of the upper part of its body are of a bluish grey; and the back of the head, the breast, belly, and thighs, white. The male and female, however, vary much in colour, as we have said. The former is lighter and the latter darker. The middle feathers of the tail are grey, and the outer webs of the others are of the same colour, but the inner ones are marked with alternate bars of white and rust colour. The claws are black, and the legs, which are long and slender, yellow. Although it is a very rapacious bird, of great courage and strength, it seldom attacks healthy grouse and never seizes anything on the wing. It preys on young hares, rabbits, rats, and mice; lapwings, curlews, snipe, larks, small birds, water-fowl, frogs, lizards, vipers, and snakes. As many as twenty lizards have been found in the craw of a single harrier. It is quite a mistake to say that it is a great grouse destroyer.

Mr. E. T. Booth, the famous naturalist, and owner of the splendid museum of British birds in the Dyke

Road, Brighton, states, in his descriptive catalogue:—
“It is said to be very destructive to game, but my own observations would lead me to believe that it preys more on small vermin, and birds of about the size of the titlark, than on anything larger. In the summer of 1869, while walking over a moor in the east of Sutherland, I disturbed a ringtail (the female of the hen-harrier is known by this name) from her nest, which contained one young one just out of the shell, and five eggs on the point of hatching. As both the old birds were flying round in a state of great consternation, I sat down to watch their actions for a few minutes. On rising to leave the spot I discovered I had laid my gun on the back of an old grey hen, who now got up from her nest, in which were three fresh-laid eggs, evidently showing that she herself had chosen this apparently dangerous locality for her nursery, as the harrier’s nest was within six or seven paces. This is not the only instance I have met with of game and birds of prey being found in close proximity.”

The peregrine falcon (*Falco peregrinus*) is the well-known hawk that is trained for the chase, in which it holds the first place. It is very courageous, and makes its stoop with dash and fury. Its celerity of flight is almost incredible, nearly a hundred and fifty miles an hour. It will pursue for many miles at a stretch in a single chase, and hardly ever fails to secure its quarry. It never touches birds on the

ground, unlike the sparrow-hawk. At one time Scotland was celebrated for falconry; but the grand old sport has now fallen into disuse—has almost disappeared from amongst us. For the chase we think the peregrines should be taken from the nest before they are fully fledged, as they train better. Some sportsmen, however, prefer them when caught in full age and vigour. When full grown it is a handsome and beautiful bird, and whether it is even partially migratory is still doubtful. We think that it is, and that, as a rule, it leaves this country early in autumn. It seldom soars like the eagle, and never strikes its prey near the ground. So impetuous is it in the pursuit of birds that it frequently causes its own destruction by dashing against large trees or huge boulders. It secures its prey by sudden descent as well as by pursuit, and its cry is shrill and loud, and can easily be distinguished from that of other hawks. It builds early in the spring, usually in a crevice of a projecting rock or cliff, and lays three or four eggs, rarely more, sometimes only two. It is about the same size as the common falcon. Length from point to point of wings, forty inches, and about seventeen inches long. Its beak is blue, but black at the point; cere and irides yellow. The upper parts of the body are ash-colour, beautifully marked with bars of blue and black; under part of neck and throat white; the quills are dusky, spotted with white; the tail is barred with blue and black. The claws

are black and the legs yellow. The hen is especially beautiful.

“Under the heading of ‘Hawks and the Moors,’ the peregrine has given rise to many discussions in the sporting papers; some writers declaring that they do but little damage on a grouse moor, being of opinion that the few birds they take are usually the diseased and weakly, whilst others class them amongst the very worst of thieves. These discussions evidently being, for the most part, between falconers on the one side and game-preservers on the other, there can be but little doubt that each party takes a rather one-sided view of the case.”—E. T. Booth.

Its food principally consists of birds, such as sea-gulls, guillemots, plovers, curlews, ducks, land-rails, partridges, grouse, pigeons, rooks, and grey-crows. It is also fond of hares, rabbits, rats, moles, and other small quadrupeds, and at times kills cats and even dogs. Its castings have been proved, on examination, to be composed generally of the bones and feathers of gulls and other aquatic fowl; some mixed with the remains of partridges and the bones of rabbits and hares. This, we think, goes far to show that grouse is not the chief food of the peregrine, as many game-keepers assert. Moreover, it should not be forgotten that it will kill and eat kestrel and merlin and other species of hawks. In the end of November last a fine specimen of this bird was shot at Scarborough, which weighed one pound

and three quarters, and measured thirty-eight inches across the wings. It was a mature male bird in excellent plumage, no doubt on its way to cross the channel.

The sparrow-hawk (*Accipiter nissus*) is a short-winged, active, little bird of great pluck and daring. Its courage is almost reckless, for it will fly at any bird, no matter what its size, and kills both in the air and on the ground. So strongly and precisely does it strike, that its first blow is fatal. It hunts in woods, moors, and open fields, and is partial to cultivated districts. It seems to sail on the wing without exertion, stealthily, and swiftly, and at times it ascends and poises apparently motionless while on the look-out for its quarry. In this position it looks gentle and pretty; but soon it dashes with wonderful rapidity and snatches its prey. When thus disporting itself in a Highland glen the scene is grand and enchanting to every lover of nature and naturalist who may have the good fortune to behold the sight. Its food consists of birds, chiefly the smaller larks, thrushes, blackbirds, sparrows, swallows, linnets, yellow-hammers, bull-finches, pepits, and wrens; also, some that are larger—jays, pigeons, partridges, and grouse. It is likewise fond of rats, mice, moles, beetles, and grasshoppers. It does not always build its own nest; but takes possession of some deserted tenements of a crow, magpie, or other bird. It sometimes, too, makes its nest on the ledge or crevice

of a rock. It lays from three to six eggs ; but rarely hatches so many as six. Curiously, the males and females appear to separate in winter. It is rather a small bird, the length of the male seldom exceeding ten inches, and the female fifteen inches. Its beak is blue; the eye bright orange, the legs yellow, and the claws black. A female, which is described by Bewick, had a few scattered spots of white, which formed a faint line, running backwards towards the neck ; the top of the head and all the upper parts of the body were of a dusky brown colour ; on the back part of the head there was a faint line of white; the scapulars were marked with two spots of white on each feather ; the greater quill-feathers and the tail were dusky, with four bars of a darker hue on each ; the inner edges of all the quills were marked with two or more large white spots ; the tips of the tail feathers were white, beautifully barred with brown; and the throat was faintly streaked with the same colour. The same author describes a male as having the upper part of his body of a dark lead colour, and the bars on his breast more numerous.

The gos-hawk (*Auster palumbarius*), apparently a corruption of goose-hawk, is indigenous to Scotland, especially to the central parts. Owing to the shape of its wings it is unable to take long flights, and therefore takes more terrestrial than aërial quarry. It possesses undaunted courage and great muscular power, and in its habits generally it much resembles

the sparrow-hawk. It does not stoop, but glides along straight after its prey quite close to the ground. Its food comprises hares, rabbits, rats, mice, moles, pigeons, grouse, partridges, gulls, wild ducks, snipe, lapwings, crows, rooks, magpies, blackbirds, and thrushes. But it is only when pressed by hunger that it will venture to cope with the larger birds. It rejects carrion. It is a prettier bird than the buzzard, and rather longer. Its beak is blue, tipped with black; the cere is yellowish green; the eyes yellow with a white line over them. Its legs are yellow, and claws black. The plumage of the head and upper parts of the body is deep brown, and each side of the neck is marked with white, which is the colour of the breast and belly, having numerous bars of black. Its nest is commonly composed of small sticks, moss, and grass, put roughly together, and it will tenant the same nest for years if undisturbed, repairing it from time to time. It produces three or four eggs, which are hatched about the middle of May, after three weeks incubation. It is from ignorance that the gos-hawk is denounced as "very destructive" to grouse.

The merlin (*Hypotriorchis æsalon*) is the smallest of the British falconidæ, as dashing and spirited, however, as any of the hawk tribe, and as bold as a game-cock. It is a beautiful bird, of about twelve inches in length, full of life and vivacity—as nimble as an eel, and voracious as a shark. In striking its

prey it never fails to hit a vital part, so that its quarry falls instantly. It makes its nest on the ground, in rough land where there is abundance of boulder and wild shrubs, and on the shelf of a cliff or rock. It feeds on small birds, larks, starlings, linnets, snipes, swallows, blackbirds, thrushes, and on cockchafers, and other insects. It is said to kill full-grown healthy grouse; but there is little authority for this statement. Assertions of the kind are made by many persons who, unable to distinguish one bird from another, declare that the merlin is only a winter visitor, although it breeds in some of our northern counties! Its back and wing-coverts are a lovely light blue.

The Elfin King the merlin's wing,
Are his pinions of glossy blue.

It is very like the peregrine falcon in general appearance, but not nearly its size. Its entire length is only about twelve inches, and seldom weighs more than eight ounces. Its beak is blue; cere and irides yellow. Its head is rust-colour streaked with black; back and wings blue streaked with black, and edged with rust-colour. Its tail is long for its size, and is prominently marked with alternate dusky and pale bars, whilst its legs are yellow, and claws black.

“Immature birds of this species are frequently met with in the south, though the true home of this dashing little hawk is evidently in the land of the heather and mist. They are said to be very destructive to

game, and as such usually pay the penalty that the possession of a bad name incurs. Whether it is that my own experience, with regard to this bird, has been too limited to form a correct judgment I am unable to say, but I hardly think that they are the desperate characters that they are generally described. Those which I have seen in the south were usually in pursuit of small birds, and while seeking this sort of prey they are frequently captured in the clap-nets that abound near Brighton.

“On the grouse moors in the north I have examined the remains of the victims that they have consumed near their nests, and never found anything larger than a dunlin, which bird, with larks, pipits, and large moths (principally of the egger species), seemed to make up their bill of fare. Though frequenting most of the wild, rocky glens in the Highlands, they seem to have a partiality for the more open moors, being particularly numerous in the flat parts of Sutherland and Caithness.”—E. T. Booth.

The kestrel (*Tinnunculus alaudarius*), or wind-hover, as it is sometimes called, is to be found in almost any part of the country. It has marvellous sight, observing the smallest mouse on the ground as it poises in the air. Field-mice are its chief food, and it is therefore most useful to farmers. Nevertheless, keepers who have a mania for game preservation will swear by all that is sacred that it is a bold destroyer of grouse and partridges. It is of the hawk species.

that is quite enough for them. “Stonehenge,” one of our great authorities, says, “It will always prefer the mouse to any bird, and I believe rarely attacks any other prey than the mouse or the frog. It will not attack the young of the game birds, and its only fault is, that it will sometimes take the very young leveret.” This coincides entirely with our own experience. It sometimes changes its diet, no doubt, like all animals; but then it takes to small fish and the smaller reptiles, such as frogs, newts, &c. When frequenting the sea-coast it eats shrimps, small crabs, and flying-beetles. We are quite certain that it never poaches on game preserves—that it never destroys grouse. Its destruction is exceedingly unwise, and much to be regretted, for, besides being harmless to game, it is a very pretty bird—a great ornament to the country.

“This is by far the most numerous of the hawk tribe in Great Britain. Though not generally so regarded, it is one of our most useful birds, being a decided ally both to the farmer and game preserver. I have been so frequently assured that kestrels have been detected preying upon young game, that I suppose some misguided old bird must, when greatly pressed by the cares of providing for a hungry brood, have snatched some precocious young pheasant from the neighbourhood of the coops, and, like many another poor bungling thief, been caught at the first attempt, while the greater rogues go free. The rats alone that these birds destroy, while procuring food

for their young, would commit ten times more damage in one year than the poor inoffensive kestrels could possibly effect in their whole lives.”—E. T. Booth.

It forms its nest either on the ledge of a rock or on the topmost boughs of lofty trees, and constructs it of decayed branches, moss, and rough grass. It lays three or four eggs, sometimes five; but the fifth is usually small and often addled. Many naturalists maintain that the kestrel is a migratory bird. For our own part, we do not think it roves beyond the bounds of this country. At all events, the total disappearance of the species in winter, as alleged, is certainly disproved. It is a very remarkable bird in its general appearance, and is more like an owl than a hawk when young. Moreover, the plumage of the two sexes differs so widely as to require to be described separately. A naturalist of repute states that the male is in length fourteen inches; breadth two feet three inches; its bill is blue; cere and eyelids yellow; eyes black; the forehead dull yellow; the top of the head, back part of the neck, and sides, as far as the point of the wings, are of a lead colour, faintly streaked with black; the cheeks are paler; from the corner of the mouth, on each side, there is a dark streak pointing downwards; the back and coverts of the wings are of a bright vinous colour, spotted with black; quill-feathers dusky, with light edges; all the under part of the body is of a pale rust-colour, streaked and spotted with black; thighs plain; the tail-feathers

are of a fine blue grey, with black shafts; towards the ends there is a broad black bar, both on the upper and under sides; the tips are white; the legs are yellow, and the claws black.

The female kestrel is a beautiful bird, distinguished from every other hawk by its variegated plumage; its bill is blue; cere and feet yellow; eyes dark-coloured, surrounded with a yellow skin; behind each eye there is a bright spot; the back and wing-coverts are elegantly marked with numerous undulated bars of black; the breast, belly, and thighs are of a pale reddish colour, with dusky streaks pointing downwards; vent plain; the tail is marked by a pretty broad black bar near the end; a number of small ones, of the same colour, occupy the remaining part; the tip is pale.

We will now make a few observations on beasts of prey called "vermin" by game-keepers. In our opinion, these animals should be fostered rather than be extirpated as so many depredators having no redeeming qualities.

The fox (*Vulpes vulgaris*) is the largest and best known of these animals. In England, and in most of the lowlands of Scotland, the fox is carefully preserved for the pleasures of the chase; but in the Highlands, where no hounds are kept, he is systematically shot, and trapped, and everything done that will contribute to his extermination. So great is the prejudice against the poor fox that, but for the delight

taken in hunting him he would be as rare in this country as the wolf. In grouse districts he cannot creep from his den without fearing to find his leg fast in a trap, and dare not eat a dead hare or rabbit lest it should be saturated with poison. His life is one round of misery, for should he be seen outside a cover, or on a moor, a charge of shot is instantly poured into him by the merciless keeper. The animal is too well known to need a minute description. He is nocturnal in his habits, and usually issues forth to prowl for prey at the dusk of the evening. He lives upon birds and other animals, hares and rabbits being his principal food. Rats, mice, frogs, weasels, &c., are also comprised in his bill of fare. He prefers rabbits to grouse, and bears so strong an odour that birds are often warned of his approach. This powerful odour keeps birds away from his "earths," as they are termed by sportsmen. In them the female fox produces and nurtures her young, of which she is exceedingly fond. When attacked by fox dogs and terriers she pluckily defends her poor little cubs and herself to the last without uttering a cry.

Mr. J. H. Walsh, Editor of the "Field" ("Stonehenge"), states, in his admirable book, "British Rural Sports," in reference to the fox:—"In our present list it must appear as an enemy, although numerous and warm controversies have taken place as to its game-destroying powers. No doubt, the fox

may be preserved in the same coverts with the pheasant; and, I believe, if supplied with rabbits, he will not often fall upon any other game, and certainly not upon the hare, to which the rabbit is always preferred; the scent of the fox is so strong that most animals are aware of his proximity, and, therefore, they are able to keep clear of him, except on rare occasions, of which he does not hesitate to take advantage; the pheasant, for instance, seldom ventures within his reach; if disturbed, he has recourse to his wings, and does not often run into danger fast enough to be off his guard against the scent, though he will often run down an open ride, or in the fields, where he is secure from this insidious enemy. If, however, a pheasant is wounded, he is sure to fall a prey to vulpine attacks, and so is the wounded woodcock or snipe; but this is of very little consequence, and such a poor maimed creature as a wounded bird is better out of its misery. Keepers are great enemies to the fox, and aggravate his faults, for two reasons; firstly, because he interferes with their chief perquisites, the rabbits; and secondly, because he is the only legitimate scape-goat for their short-comings. If the complaint is made that there is no game, the answer is always ready, 'Why, sir, if you will preserve the foxes, you must not expect so much game.' There is no other game-destroyer that a keeper can charge with the loss, without damaging his own character, since, in proportion to the scarcity or abundance of

all other vermin is his own character raised or depressed."

Our good friend the late Mr. Frank Buckland, describing what he saw when visiting a Highland laird, tells us that at the head of a list of vermin destroyed on the estate were a number of foxes. In one of his interesting papers the great naturalist states:—"I told this gentleman he was quite wrong to kill these various birds and beasts, for that he was interfering with the balance of nature." Few men knew better than poor Buckland that destroying these animals is an error of judgment. Whilst admitting that the fox is an enemy of the sheep farmer, by taking a lamb occasionally to feed its cubs, we deny that he prefers grouse to hare and rabbit. He never even runs after sheep, who are so accustomed to him that they take no more notice of him than of a hare. It is a curious fact that he never kills lambs near his den; but goes far afield, miles away, so that the farmer knows that when he has a litter on his land he never loses a single lamb by either the dog or vixen fox.

The pole-cat (*Putorius fatidus*) is very common in this country, especially in the Highlands, and is a most beautiful creature. It frequents wooded tracts, broken with crags and precipices, and likes to hide in stone heaps and dark crannies in secluded rocks. It is rather a prolific animal, producing five or six young at a time. The nursery is usually in a burrow well

defended by roots of large trees and stones. The young ones appear about the end of May or the beginning of June. It hunts after sunset, and is a great enemy to hares and rabbits, having an almost insatiable thirst for blood. It feeds on birds, rats, mice, and squirrels. It is also very fond of fish, like the domestic cat, and eats frogs and toads in great numbers.

The marten (*Martes abietum et foina*) lives very much like the pole-cat, and is the largest of the weasel family. It inhabits woods, living in the hollow of decayed trees, or in deserted birds'-nests, especially that of the magpie. It is reddish brown in colour. Unlike the pole-cat, however, it rarely eats flesh, preferring the blood and brains. It is exceedingly destructive, and a formidable enemy to all small animals and birds.

The stoat (*Mustela erminea*) is in shape like the weasel, but much larger and more swift of foot. Its endurance and delicacy of scent are so marvellous that it will run down a hare, although, of course, it has not the speed, by continuous pursuit. The poor hare seems to get completely paralysed, and soon resigns itself to its fate. In summer its colour is like the marten; but changes in winter to white, except at the tip of the tail. It takes to the water freely, being a gallant swimmer, and destroys vast numbers of water-rats, which are so destructive to birds' eggs. Its food consists of hares, rabbits, rats,

mice, birds, and reptiles. Young rabbits it kills in great numbers, as it penetrates their burrows without difficulty. The wild cat is its formidable enemy, keeping down its numbers.

The weasel (*Mustela vulgaris*) is more to be dreaded by the creatures on which it preys than any other of the *Mustelina* family. It is a most audacious little creature, measuring only about ten inches in length, including the tail, of two inches long. It is wonderfully courageous, and will attack almost anything. It fastens its sharp teeth in the back of the neck of its victim, retaining its hold until its prey is dead. It resembles the stoat in most respects, except that it has not the black brushy tip at the end of the tail. It produces four or five young at a time, and would become more than pleasantly numerous but for the cat, the eagle, and the hawk.

The rat (*Mus decumanus*) is the worst pest man has to contend against. He increases marvellously in numbers; and but for the cat we should be overrun by them. Fortunately for us he has many natural enemies, and is withal a cannibal, devouring the female rats, which are more tender. He is exceedingly voracious, and much of the damage done by him is often laid upon the innocent shoulders of poor reynard, stoat, and weasel. The water-rat is a variety of the common rat, and, although not web-footed, is quite at home in the water, and is thus difficult to destroy. He is very injurious to game by sucking

eggs, and eating the young birds before they are fledged. He certainly does those things he ought not to do, and leaves undone other things. The bird preserver must kill rats, and he should always do so before the breeding season ; for the animal usually breeds three times in one year, and brings forth eight, twelve, sometimes fourteen at a time. Game preservers should use every possible means to destroy rats. The best way is to encourage eagles, falcons, hawks, foxes, cats, martens, stoats, and weasels.

We have described the habits and food of these birds and beasts of prey at some length, in order to expose what we conceive to be a great folly and injustice—destroying them without proper trial. It is like giving a dog a bad name and hanging him. Their death-warrant is signed by vulgar sportsmen, and irresponsible gamekeepers, without consideration of their useful operation in the grand economy of Nature. The trap, the gun, and poison, have hitherto formed the trinity of destruction of birds and beasts of prey, until they have almost become extinct. The notion that they are terribly injurious to game shows a pitiful ignorance of their habits and of their natural feeding tendencies, as the following evidence—given before the Select Committee, appointed in 1872, to inquire into the advisability of extending the protection of a close season to certain wild birds—clearly shows.

Lord Lilford, a most accomplished ornithologist, examined,

“ From a game-preserving point of view, is there not a good deal to be said for sparing the hawk tribe? —There is a theory I know that the peregrine falcon, if left unmolested, would tend to keep down the grouse disease ; but I am very doubtful on the subject myself. I know that some people think the peregrine falcon would naturally take the weakest bird, and so keep down the likelihood of that disease. I am not prepared to say that there may not be something in that, but I think not much ; yet I never allow the peregrine falcon to be killed on my own moors in Scotland.

“ Have you anything more to say about the hawk tribes in their favour ?—No ; they keep down birds which are noxious to agriculture. The sparrow-hawk has that claim, for he destroys a great quantity of small birds, such as finches, sparrows, and so on.

“ You think there is truth in the common expression of preserving the balance of nature ?—I think so, certainly.

“ You think it is a fair expression which sums up the case ?—Yes, I think so.

“ Then, with regard to gamekeepers, do you find that gamekeepers, as a rule, are very cruel in the matter of birds ?—The keepers think that everything but game is to be murdered. I remember once seeing five green woodpeckers, about the most harmless birds we have, hanging up among magpies, hawks, and jays.

“Keepers would kill every raven, would they not?
—Yes.

“And they would kill every jay?—Yes.

“And every magpie?—Yes.

“And the keeper would kill every hawk, would he not?—Yes, if he were left to himself.

“Are you a game preserver?—Yes.

“Do you stop your keeper from killing those birds?—Yes, everything; I have not succeeded altogether, I fear, but in Scotland I insist on their preserving eagles; I will not have an eagle killed, or a peregrine falcon, or a merlin.

“Do you think that your sport is interfered with materially by your doing so?—There is not the least interference in the world with the sport. I do not mean that we kill quite so many grouse as we should if the peregrine falcons were killed, because they do kill grouse, no doubt; I do not want to prove too much.”

The Rev. H. B. Tristram, F.R.S., a high authority, examined.

“You would yourself personally protect every kind of hawk, would you?—Every kind of hawk, particularly the peregrine; because I believe that the destruction of the peregrine has had something to do with the grouse disease. I have noticed that the hawk, in other countries, in pursuing a flight of birds, a covey of partridges, will always strike the hindmost, which is sure to be the weakest of the covey, and if

there is any disease lurking it is in that bird ; and so by the struggle for existence, where you have hawks, the race is kept purer and more healthy ?—A sportsman is very apt to shoot the strongest bird first.

“ That is, scientifically speaking, a mistake ; I mean the custom of driving by which one kills the strongest bird ; it is an injury to the breed, is it not ?—It is a most fatal injury to the breed.

“ Then I suppose you would say, on behalf of many hawks, that they destroy other kinds of vermin in all parts of England ?—I think, if the hawks were fostered too much, they might become the greatest of all vermin ; but we have now got to the other extreme. There are some hawks for which, in a thickly-populated country like this, I could not plead strongly, such as the harrier ; but that is extinct, probably ; but the kestrel, the sparrow-hawk, and the merlin, I believe all have their uses ; the peregrine certainly, apart from the question of sentiment with regard to the peregrine.

“ With regard to the kestrel, I suppose it is the same bird as is often called the wind-hover ?—Yes, it is the same bird.

“ Did I understand you correctly when I thought you said you had examined the crop of a bird ?—Yes.

“ And you found nothing in it but wire-worms ?—Yes, one hundred and seventy-eight wire-worms.

“ Was that your own personal experience ?—Yes, that was my own personal experience.

“Did you ever know a kestrel under any other circumstances destroy young partridges?—Yes, certainly I have, but not as a habitual article of food.

“What did you mean to imply when you said that you found no remnants of game of any kind, but only so many wire-worms ; did you mean that the kestrel was to be one of the protected birds?—I meant to imply that all those birds have their uses, and that the kestrel is not a game-eating bird ; I do not say there is no kestrel that may not be found to eat a young partridge, but their natural food is wire-worms, beetles, and mice ; if any birds are to be protected this is a very useful bird, and public opinion is now beginning to protect it ; many landowners forbid their keepers to shoot it.

“You will understand that that list will be on the assumption that the Act of Parliament remains as it is?—Just so.

“One more question with regard to gamekeepers destroying hawks ; you have stated that you are of opinion that hawks do a great deal of good by the destruction of rats?—Yes, some species do.

“You are, no doubt, aware that rats are the greatest scourge to partridges, and you are aware of the extent to which, if not sufficiently kept down, they destroy the eggs?—Yes.

“You are of opinion that more might be gained in a game-preserving point of view by keeping up hawks to destroy the rats, than by killing a hawk which

occasionally gets a young partridge?—Yes ; I believe that both the hawk and the weasel are game preservers ; of course, they are not rabbit preservers.

“ Then, with regard to gamekeepers, has it ever struck you, as a very singular fact, how inaccurate they are in their observations of the habits of some animals?—Yes, they are the most inaccurate class of men existing.

“ They seem to consider any bird that has a hooked beak and claws as being necessarily destructive to game, do they not?—Yes, if it is large enough.

“ They never examine the crop or the stomach of a bird?—Never, to my knowledge.”

Professor A. Newton, F.R.S., a naturalist of great repute, examined.

“ I should be right in summing up what you have said in this way, should I not, that, in the case of those birds which you have observed, the good which they do at times counterbalances the harm which they do at other times?—Certainly, but I have not been able to come to that conclusion without a very considerable amount of investigation, and considering the matter from every point of view.

“ If you were a game preserver, should you destroy your hawks?—No, I should not, unless it was the sparrow-hawk.

“ What would be your reason for sparing your hawks?—I rather hold to the theory that the falcons may stamp out the grouse disease; that seems to me

a reasonable theory, but I have no personal knowledge of it.

“It has been observed, has it not, that the falcon generally strikes the last bird of the covey ?—I think the falcon generally strikes the bird that comes easiest to him; of course, that would be a grouse or any other bird that was, perhaps, a little slack in its flight. I have been out hawking a great many times, but not so many times as the last witness.

“But you object to the hen sparrow-hawk ?—It is, in these days, the only bird of prey that does any harm to game. The falcon, about which so much has been said, is, I think, in many places very harmless. I enjoyed the acquaintance of a falcon for a great many years. She used to come to a clump of trees on a large heath, near where I lived, early in the year, and stay there for about three weeks. This heath was full of partridges and stock doves. The stock dove is a far quicker bird in flight than a partridge; but this falcon never touched a partridge. That went on for several years; she pursued and fed on the doves.”

Mr. R. Scot-Skirving, gentleman farmer and naturalist, examined.

“Have you many sparrow-hawks left in Scotland ?—Yes, we have a good many sparrow-hawks. They are migratory birds, and they have almost ceased to breed with us, because the gamekeepers kill them all: they shoot the old ones in the nest. But we still

have and always shall have a sprinkling of sparrow-hawks. They come to us in the winter.

“Does the sparrow-hawk act as a check to the wood-pigeon?—I think he would to some degree; it is a very bold bird, and he will strike a wood-pigeon or a partridge on the wing; still he preys much more on small birds.

“You yourself regret the almost complete extermination of the larger hawks, do you not?—Very much indeed.

“And many other farmers in Scotland also, I presume?—They regret it for one reason, because it allows the wood-pigeon to become so numerous. I regret it for the same reason, and because it takes away a beautiful feature from human life.”

Dr. Morris, the well-known ornithologist, examined.

“I dare say you are familiar with the common expression about the balance of nature; have any facts come to your knowledge which make you think that if that balance is disturbed it produces unfortunate consequences?—Several facts have come to my knowledge quite recently, besides others that occurred in former years. On Lord Middleton's estate, near Nottingham, one of his tenants, Mr. Thornton, told me that at the present time Lord Middleton is paying for the destruction of seven hundred or eight hundred, and sometimes as many as one thousand five hundred, rats per month; he attributes that, as I certainly do, to the almost entire extinction of owls, hawks, and

weasels, and more particularly weasels; the destruction is so great, that he says he can hardly keep a chicken about his premises.

“Do you ever recollect speaking to Mr. Waterton on the subject of birds of prey not feeding at home? No, I do not; I know that he used to have owls, jackdaws, and starlings, all nesting within a few feet of each other, and they never interfered with each other at all. I perhaps might be permitted to call the attention of the Committee to an article in the last ‘Quarterly Review,’ an exceedingly good article on this very subject. The writer mentions there, that on some of the moors in Scotland, since the destruction of the hawks and eagles, the vipers have increased to such an extent that people can scarcely cross the moors in safety during the summer. He states that as a fact; he also mentions that the eagles live chiefly on the blue, or what is called the Alpine hare; the one that turns white in the winter. He says, that deerstalkers find great difficulty in getting to the deer, on account of the predominance of those hares; the moment you try to stalk a deer, up jumps one of those hares and bolts across, and frightens the deer away.

“How do you account for that great increase of rats of which you spoke?—In the first place, the soil at Lord Middleton’s place is light soil in which they can burrow easily; all the hawks and weasels have been most carefully exterminated, so I was told; my

informant was Mr. Thornton. I think that increase of rats is entirely due to the destruction of hawks, owls, and weasels."

Mr. Robert Gray, author of the admirable book entitled, "Birds of the West of Scotland," examined.

"What should you propose to do about the hawk family?—I should be inclined to protect them all.

"Will you be kind enough to state to the Committee what, in your opinion, would be the advantage of doing so?—I think, for one thing, if birds of prey were generally protected throughout Scotland we should hear less of the grouse disease.

"In what way would the hawk tribe help to keep down the grouse disease do you think?—They would kill off the sickly birds.

"Have any instances of that come under your own observation?—Yes, many.

"Will you be kind enough to state to the Committee any case in point?—The common buzzard is a very useful bird in that respect; it is of indolent habits, and rests generally on the stump of a tree, or some rock in a solitary situation, and picks up young birds that are not able to save themselves, and wounded birds also; wounded birds, and sickly young birds, would, in the course of time, perpetuate a degenerate breed, and I incline to the views that those degenerate birds are the chief source of the so-called grouse disease.

"Perhaps you have heard that the theory has been

broached once or twice or more, that, if hawks were generally preserved, it would have the effect of getting rid of the grouse, pheasant, and partridge disease, by reason of the hawk catching weakly birds when rising?—Yes.

“Have you not heard that very often the old birds throw themselves between their young and their enemies?—Yes.

“Would it not probably follow that the parent birds would be killed, and that under such circumstances you would loose the whole brood?—I have seen old birds protect their young in that way. All the stronger young birds were quite able to get behind the mother, but there was generally a bird outside which suffered, and that was the sickly bird of the brood. I have frequently noticed that. In the outer Hebrides, a district extending about one hundred and thirty miles, there is no grouse disease. There are many birds of prey still allowed to live there, and that is about the best argument I can give for the protection of hawks.”

Mr. W. C. Angus, Aberdeenshire, a naturalist of fame, examined:—“If I understand you rightly, you would protect a certain number of birds by a close season, and no more?—Yes, I would protect all birds that are decreasing; I would protect the eagle, the raven, the raptorial birds generally, and the owls. I may state that the late Prince Consort, on Deeside, gave an excellent example in that respect; such

species are strictly protected in the Royal forests both at Balmoral and Abergeldie. I think Mr. Mackenzie, of Kintail and Glen Muick, protects them also ; but certainly the Marquis of Huntly, who is himself an ornithologist, and Mr. William Cunliffe Brookes, Member of Parliament, are very strict in protecting raptorial birds.

“ You mean the owls and the hawks of all descriptions?—Yes, and eagles ; but those birds go over such a wide range of country, that unless they be generally protected the chances are that they will be destroyed somewhere.

“ Has the sport of those gentlemen suffered in any way from that protection?—Not that I am aware of ; the quality of sport improved by the presence of those birds.

“ You said that you had found in the stomachs of raptorial birds, moles, rats, and weasels ; in the stomachs of which raptorial birds have you found weasels?—I have found them in the golden eagle, in the peregrine falcon, and the sparrow-hawk.

“ You have not found them in the stomachs of smaller birds, such as the kestrel or the merlin?—I have found moles and small weasels in the stomach of the kestrel, but it is generally beetles, mice, and small birds that you find in this species.

“ Do you not think that the weasel does quite as much good in his way by destroying rats and mice, as any of those raptorial birds do, or more perhaps ?

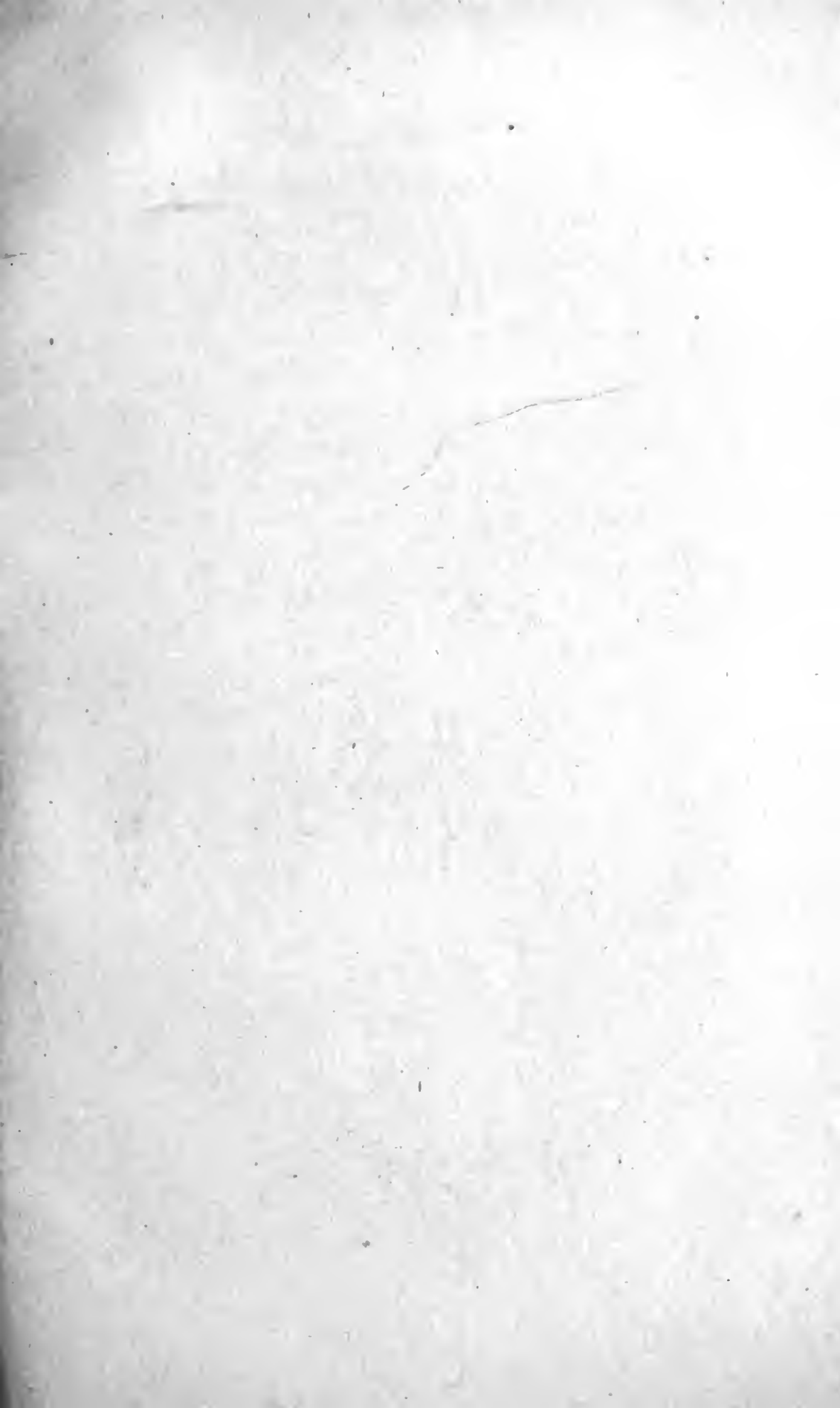
—Yes, but he is destructive to hares and rabbits also ; I think, as a rule, nature, if left to herself, would very fairly preserve the balance.”

We affirm positively that it is highly unwise, indeed criminal, to interfere so ruthlessly with the Divine organization of nature. Why exterminate our best allies? Why lift our hands so unsparingly against the protectors of our moors? Since we do so we must expect evil consequences, as the laws of nature have been imposed by an infallible Power.

There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy.

Reader, take the work of preservation to heart. You have, without doubt, pondered the marvellous economy of nature, manifesting His omniscience in the minutest details within our ken. Help, then, to restrain the ignorant rebels who would pervert the infallible system of a Divine authority.

Accuse not Nature, she hath done her part ;
Do thou but thine.





CAPERCAILLIE.

CHAPTER IV.

Yet grouse of other kind
 The fowler often finds, of larger growth
 And glossy jet, Black game, or Heathcock termed.
 Nor are the Red on every healthy moor
 Or rocky mountain found ; full many a waste,
 Washed by the southern, or the western main,
 Has ne'er received them, though abundant else
 In store of footed, or of feathered game.

THERE are four species of grouse in the British Isles called capercailzie (*Tetrao urogallus*); black game (*Tetrao tetrix*); red grouse (*Lagopus scoticus*); and ptarmigan (*Lagopus albus*). As the red grouse is the chief subject of this treatise, and affords better sport than all the others put together, we will only notice the other branches of the grouse family very briefly.

CAPERCAILZIE, or cock of the wood, as it is called by naturalists, is the largest of the birds of the grouse tribe, nearly equal to the turkey in size, and is also the most beautiful in plumage. It was once a

common inhabitant of the Highland districts of Great Britain, but disappeared. Those now found were reared from importations, notably at Taymouth, where they are numerous. Their restoration in Ireland utterly failed, probably owing to the demolition of the old woods. They are exceedingly abundant in Norway and Sweden, and are imported to this country by game-dealers, although the flesh is not considered particularly good eating. Its eggs, however, are very delicate and highly recommended to invalids. It lays eight or ten on a rough nest, composed of twigs of the brushwood it inhabits, and of coarse grass and moss. It feeds on vegetable substances, on the young shoots of fir, juniper, cranberry, and other trees, shrubs, and plants. It remains in the great forests of Norway and Sweden all the year round, and packs in winter in hundreds. When thus together they are easily shot by the hunter, who is never a fair sportsman, for after dark he slaughters the poor birds by torch-light as they gaze in amazement at the blazing fire. Its favourite haunt in Scotland is the thick wood—the depth of the forest of pine, beech, oak, and birch. We rejoice that it is again the pride of the northern forest.

Capercailzie is increasing in Perthshire and neighbouring counties, and spreading wherever Alpine woods prevail. On the 25th of last October Mr. Renton and two friends bagged nineteen magnificent specimens of this noble bird. In connection with the

day's sport a very interesting case, involving the question as to whether capercailzie is included in the list of birds known as game, was tried at Perth on the 10th of November last, before Sheriff Barclay. As reported by the "Perthshire Advertiser," John Thomson, innkeeper, was charged, at the instance of the Board of Inland Revenue, with having used a gun for the purpose of killing game, at Knockintober on September 23rd last, without having a game licence. He pleaded not guilty. John Stewart, gamekeeper, Kinmaird, stated that on the day in question he was out with a shooting-party. There were six guns altogether, and Mr. Thomson was one of the party. In the forenoon they shot in the Killiehangie capercailzie wood. Capercailzie were shot that day, but witness could not say whether Mr. Thomson, who had a gun, shot any of them. While at Knockintober, on the way home, a covey of partridges arose, and alighting in a turnip-field, eight of them were shot. Witness did not see Mr. Thomson fire, and did not know if he did fire. Mr. Thomson was invited personally by Mr. Renton, the shooting tenant, to join the party that day. The sheriff, on asking who informed against Thomson, was informed that it was John Campbell, ground officer to the Duke of Athole, his reason for doing so being that he had some spite against Mr. Thomson. Three gentlemen who were expected to join the shooting-party were unable to attend, and rather than send the beaters home it was

suggested to Mr. Renton that he should ask Mr. Thomson to join them, as he was a good shot. After Mr. Renton invited Mr. Thomson he heard the latter saying that he had a gun licence. Witness was not aware that capercailzie were game. He had been a keeper for upwards of thirty years, and had never heard them spoken of or treated as game. James Stewart, gamekeeper, Kinnaird, and Robert Hankinson, gamekeeper, Ballechin, corroborated. Both these witnesses agreed in stating that Mr. Thomson was out of gunshot distance when the partridges were killed. Mr. Manson, supervisor, Aberfeldy, in the course of his examination, stated that he was informed by John Campbell, ground officer to the Duke of Athole, that Mr. Thomson was in the habit of shooting game, although he had no game licence. Witness investigated this report, and was able to identify Mr. Thomson as having been out on the day in question. Mr. Thomson took out a game licence on September 26th, after the case had been reported. The solicitor who acted for the prosecutors maintained that capercailzie were included as game under the Act 1621, cap. 34. For the defence it was urged there was not a particle of evidence to show that he had used his gun for the purpose of killing game. The sheriff said that the case was a peculiar one, that he would take it into consideration, and give judgment next week.

We would observe that capercailzie are not men-





BLACKCOCK.

tioned as "game" in any of the Acts affecting game in England or Scotland; neither in the Day Poaching Act, 1 and 2 Will. IV. c. 32, England; 2 and 3 Will. IV. c. 68, Scotland; Night Poaching Act, 9 Geo. IV. c. 69; and Poaching Prevention Act, 25 and 26 Vic. c. 114, United Kingdom. The Excise law regarding game—viz. the 23 and 24 Vic. c. 90, which requires a licence to be taken out for killing "game"—gives no definition; but the definition fixed by 1 and 2 Will. IV., England, and 2 and 3 Will. IV., Scotland, has hitherto always been adopted, but neither includes the capercailzie. Indeed, at the time of the passing of both the Acts 9 Geo. IV. and 2 and 3 Will. IV., this bird had been an extinct variety of bird for many years in the United Kingdom. The Act of 1621 (James II.) certainly mentions capercailzies as "wyld foulles," and makes provision against the buying and selling of "termigantis, quailzies, *caperkailzeis*," etc., under a penalty of one hundred pounds; but we doubt not the Act of 1621 is obsolete so far as the Excise Acts are concerned in reference to game licences.—"Land and Water."

Sheriff Barclay, in finding the case not proven, said he was not prepared to state whether capercailzie were game or not. He had had a conversation with Colonel Drummond Hay, of Seggieden, that day, who expressed the opinion that capercailzie were not game, but a species of grouse.

BLACK GROUSE, familiarly known as black game,

is abundant in most of the woods, and rough heath in the north. It is especially fond of the scrubby edges of forests in the summer. It is an exceedingly wild and wary bird when it has escaped the marksman for a season. It then becomes shy and crafty and difficult to shoot. It lodges on the ground in summer, and perches on trees in winter, preferring the fir and birch. It is a very pugnacious bird, and cannot live with its red brother. Indeed, it has been often noticed that where black game abound grouse have almost disappeared. Consequently, some sportsmen shoot the hens down hard, in their preference for the red variety. We know of instances in which the black cock being killed off, the red bird returned to its old haunts. The black cock never pairs—he is a polygamist, indulging in as many wives as he can get. The males separate from the females in the autumn and live together a batchelor life until the breeding season, when they all seek the hens and at once fall in love and quarrel. They sometimes combat to the death. It is exceedingly proud—the cock possessing an inordinate amount of self-esteem, disdaining to occupy himself in any way with family cares, and leaving the hen to prepare her nest, sit on her eggs, hatch them, and bring up the brood. Its nest is formed of twigs, wild grass, and short herbage, commonly under the shelter of a bush or large stone. It lays from eight to ten eggs. Curiously, although black game is to be found nearly all over Scotland, it





PTARMIGAN.

is said that all attempts to naturalize them in Ireland have failed.

PTARMIGAN is the smallest of the British grouse, and is only found among the rocks and stones on the highest mountains in the north and west of Scotland. In Norway and Sweden they abound, as they love Alpine solitudes. It is said by some old writers that they at one time existed in the hilly parts of England. However that may be, the Grampian range is now their most southerly resort. The ptarmigan is not indigenous to Ireland. The picture by Elwes is an admirable representation of them in a state of nature.

It seems to revel in snow, and seldom descends from the high mountains except in very severe winters. At night it roosts in snow, scraping out a hollow in which it lies. It makes its nest on the bare ground, among the stones or pieces of decayed rock, and lays eight or ten eggs in June. It sits early in July, incubation lasting for about three weeks. It feeds on various sorts of Alpine plants, berries, and seeds. Its flight is low and straight, but not rapid. It is a tame, dull, and stupid bird, affording little sport. In summer its colour is undistinguishable from the rock, stones, and moss, rendering it difficult for the eye to discern it. In winter it changes its garb to a pure white, except the space between the beak and the eye, which shows a black mark. When its plumage is changing colour it is a most lovely bird

mottled all over, being feathered down to the very claws. It is truly the bird of the mountain, where nature is seen in her wildest and grandest beauty.

“It is only the oldest birds that assume the pure white dress so early as the end of the shooting season, the young occasionally retaining several grey feathers in their plumage a month or even six weeks later ; and, judging from my own experience, I should be of opinion that some of the more backward birds do not become thoroughly white till their second winter. This change is not a moult ; the white appears first at the point of the feathers, and then gradually spreads down to the root or quill. I have now and then killed ptarmigan which at first glance appeared perfectly white, but on being more closely examined showed several stains or lightly-marked blotches on their plumage, and on turning back the feathers I have discovered that a few were still half-grey, and their darker colour showing dimly through the pure white covering of the adjoining or overlapping feathers, gave the stained appearance to their otherwise spotless plumage.”—E. T. Booth.

RED GROUSE (*Lagopus scoticus*) affords more enjoyable shooting than any other bird. Seeing that it is found in England, Wales, and Ireland, we think it might well be named *Britannicus*. It does not naturally occur beyond the limits of the British Isles, and always breeds true, never cohabiting with other birds.

Unlike the ptarmigan it does not change its colour in winter, and feeds chiefly on heather. No doubt the red grouse slightly varies in the colour of its plumage, according to the locality in which it lives, and the season of the year. We know that its colour is different in the east of Scotland from what it is on the west coast ; and that there is some difference in its weight. The cultivation of the land has a good deal to do with this, modifying its habits and disposition. To see the red grouse in perfection we must go to the most remote and secluded parts of the Highlands, where it is the uninterrupted inhabitant of the moor—the native of heather and rock, of hill and glen. As cultivation advances the habits of all wild birds, and their choice of food, undergo change. Like the Red Indian, the red bird suffers with the cultivation of the land, and like him must recede before the plough and the spade. Neither can flourish under other than primitive conditions.

The excellence of the red grouse as an article of food need hardly be remarked on here, as there is hardly a better bird for the table. It pairs early in the year—in a mild season, in January. The female begins to lay her eggs about the end of March, numbering from eight to fourteen, and sometimes sixteen. The male, unlike some birds, never sits on the eggs. As soon as the young are freed from the shell they move away for food, the old birds teaching them to pick the fine young heather and the tender leaves of

the berry-plants. The young broods lie close in the first of the season; but, as it advances, they get strong and wild and begin to pack, especially in wet windy weather. Although they have a strong attachment to the spot where they were hatched, if that be low-lying ground, they will make for the hills on being disturbed by the shooter. When hatched on high land, however, they seldom fly far, generally winging their way round the base of the eminence. The morning and afternoon is the best time for finding them, for in the heat of the day they lie very close for hours in secluded sheltered spots, when even sporting-dogs will pass close to them without winding them. They feed morning and evening, and get scattered over the moor; and grouse, like partridges, are approached best after they have fed. We know men who go at grouse at peep of day, before the stars have faded out of sight; but they never fill their bags satisfactorily. That "the early bird picks up the worm" does not always hold good with regard to sportsmen. If grouse do not get time to eat their breakfasts they are off at the first sight of man and dog. After feeding, they lie and rest, and are not so much on the alert. We have always found, too, that in windy wet weather the best way to approach them is from below, as they cannot see the sportsman so well as when he is descending from the high ground. In such weather they resort to the lee of the hills for shelter, and pack close together, affording an excellent

opportunity for those who love slaughter instead of sport.

Some naturalists assert that red grouse inhabit the wilds of North America. This is an error, from our personal knowledge of that country. There certainly is a fine species of the grouse there; but it is the *Tetrao obscurus*, larger than the Scottish grouse, and different in other important respects. We fully described it in our remarks on the "Natural History of British Columbia." He is larger than the Scottish grouse, and his flesh is comparatively insipid. His throat is capable of great inflation, and he utters a very peculiar cry, resembling that of an owl, which is heard for three or four miles. He is generally found perched on a lofty tree; and in uttering this mournful cry not unfrequently sounds his death-knell, as the sound is heard at a great distance, and guides the shooting savage to the unsuspecting victim. He also makes a sort of bumping sound with his wings, which can be heard nearly a mile off. The strokes of this drumming are at first slow, and repeated every few minutes, but gradually increase in rapidity until the sound is not unlike distant rumbling thunder. He drums the most after dawn, and in the evening before nightfall. The sound appears to be much nearer than it really is, and the inexperienced fowler cocks his gun, thinking himself within range: but he is deceived, and it is not until he has slowly and stealthily advanced many hundreds of yards further that he gets

a fair shot at him. By imitating the sound in the spring-time, the sportsman may shoot many a fine cock which flies towards him, thinking it proceeds from another of the species that invades his range. At other seasons of the year they are difficult to find, and one may travel the forest for hours without being able to bag a single bird. They keep together in coveys until the pairing season, like grouse in Scotland. A full pack consists of twelve or fourteen, and it is not uncommon for two packs, or coveys, to associate. Sometimes the whole covey may be shot, without any one of them taking wing.

There is a great discrepancy in the accounts given by naturalists of the haunts of the *Tetrao obscurus*; but we are of opinion that it is a bird of the wilderness, that loves the hills and glens, as the red grouse of this country delights in the solitude of the moors.

The early plumage of the red grouse partakes of the hue of the female, which is of a pale ground tint, marked with white bars. Its mature plumage is a rich reddish brown, deepening in shade on the under part, with whitish tips, and barred across with dark brown. There is, however, a variety in the markings according to the districts of the country it inhabits. At breeding time the feathers of both the male and female change a good deal in colour, the white becoming somewhat yellowish. Moreover, the red bar above the eyes increases in size and depth of colour. We are told that Sir William Jardine shot a

grouse on the moors of Galloway, whose ground colour was yellowish white, and whose dark markings were reddish brown, much lighter than the ordinary hue, while the quills were dirty white. Grouse bred in a moor in which the heather is of a bright purple tint are brilliant in colour, whilst those bred in poor, naked land, where the heather is brown, near cultivated ground, are of a dingy colour. Their plumage so perfectly resembles the surface of the soil they inhabit, and mingles so well with the heather, moss, brackens, and rocks, that the most practical eye is often at fault in detecting their whereabouts when squatting. Nature, ever watchful over her creatures, always makes some provision for their protection.

The grouse in Scotland is a larger and finer bird than that met with in England, and more delicate eating. No doubt the mountainous character of the country, the nature of the soil, temperature, and vegetation are the influences to which this may be attributed. The flesh of the grouse is as susceptible of modification by climate and food as that of sheep. The palate readily determines whether grouse have been shot on the east or on the west of Scotland—whether on high or low ground. The one has the pure heath flavour, whilst the other tastes of the level country herbage, and of corn stooks. We can all readily distinguish between the flesh of a mountain-fed sheep and an animal fattened on a Midland farm on artificial food. The superiority of the one to the

other is unmistakable. In the London market the Southdown and Scotch mutton is considered superior to all others. So with the flesh of birds, which is always strongly impregnated with the character of the plants on which they feed. Who has not noticed the strong flavour of pine in the capercailzie?

Touching the flavour of grouse, we are tempted to give the following remarks which appear in Baily's justly popular magazine of last September:—

My old friend M. Alexis Soyer, of the Reform Club, the most intellectual gastronomer of his time, and a man whose society was much cultivated, used to say, "Ah, my dear Mr. Manner-ing, there is a wonderful *goût* in your bird of the heather which baffles me; it is so subtle that I fail to analyse it. It is, of course, there, because of the food that it eats, the tender young shoots of your beautiful heath; but it is curious, sir, that in some years these birds are better than in others. Once in about six seasons your grouse is surpassingly charming to the palate, the bitter of the backbone is heavenly, and the meat on the fleshy parts short and of exquisite flavour, but for common I feel no difference; in all other years the beast is mediocre, and not any of the attentions of my art will improve it. In such years I leave it alone, but in the years of its perfection I do eat one bird daily, roasted, and with nothing; no bread sauce, no crumbs, no chips, no nothing, except a crust of bread to change occasionally my palate. Ah, sir, grouse, to be well enjoyed, should be eaten in secret; and take my experience as your guide, do not let the bird you eat be raw and bloody, but well roasted, and drink with it, at intervals, a little sweet champagne. Never mind your knife and fork; suck the bones, and dwell upon them. Take plenty of time; that is the true way to enjoy a game bird. Some gentlemen here (Reform Club) think they can teach me the mode of my art. I hear them, but they are as mere children in their methods of eating; they follow the superstitions of their fellows. Bah!"

We do not agree with the famous *chef* that the "beast" is in any year mediocre. We esteem its flesh just as good one year as another, when it is in proper season, and from a high northern moor. As we have just observed, where the grouse is wildest, its flesh eats the best, and it is well entitled to head the list of British game birds, whether for sport or for the table. By far the best and most enjoyable shooting we have had in our long sporting career has been on the Highland moors—the peaceful solitudes of nature—in pursuit of red grouse.

Sport on the moors last season was, upon the whole, eminently satisfactory. Naturally, on the vast range tenanted by thousands upon thousands of grouse, disease of some sort is never absent. We shall, however, go fully into that subject presently. We wrote to the Press in July, that we had taken a great deal of trouble to get trustworthy information of the prospects of the moors for 1882; that, owing to the open winter and mild spring, grouse had a most favourable hatching season, so that the yield from the nests was highly satisfactory; that in nearly all the broods there was a good average of from six to twelve bonny cheepers, both in Scotland and in the north of England. We stated that the youngsters were well forward, and that there was plenty of excellent feed in the heather nursery, and capital shelter by night, so that the birds would be exceptionally strong on the Twelfth. Our prediction has been

fully verified, as will be seen from the following reports.

Although some of the bags have been below the average of former years, the aggregate number of birds killed has been prodigious. In England sport has been much above the average, as it has been also on several of the Welsh moors. The following return made by Sir F. A. Milbank to the "Field," confirms this. Two hundred and two brace to one gun in a single day!

YORKSHIRE.—WEMMERGILL LODGE, MICKLETON, BARNARD CASTLE.—I enclose you the four days' shooting on my moor. You will observe the first two days I had seven guns, the last two only four guns. Owing to the bad weather we could not get out on the 22nd and 23rd, as intended. Grouse are as numerous as in the great year 1872. Not a single unhealthy bird has been seen; the fine plumage and condition of the birds is a proof of their health. The birds are greatly packed in thousands together, some "packs" extending nearly half a mile in length, consisting of many thousand birds. The weather during the four days' shooting was pretty fine, although heavy showers fell at intervals.—FREDK. A. MILBANK.

WEMMERGILL MOOR SHOOTING.

	Aug. 24. Brace.	Aug. 25. Brace.
Sir Frederick Milbank, Bart., M.P.	202	171
Mr. Powlett Milbank	175	130 $\frac{1}{2}$
Lord Kensington, M.P.	114	136 $\frac{1}{2}$
Mr. A. P. Vivian, M.P.	114	115
Col. Keith Fraser	104	81 $\frac{1}{2}$
Mr. Mark Milbank	108	85
Marquis of Abergavenny	94	81 $\frac{1}{2}$
	<hr/>	<hr/>
Total	911	801
Picked up afterwards	15 $\frac{1}{2}$	16
	<hr/>	<hr/>
Total killed	926 $\frac{1}{2}$	817

	Aug. 29. Brace.	Aug. 30. Brace.
Sir Frederick Milbank, Bart., M.P.	115	92½
Mr. Powlett Milbank	100	75
Mr. Mark Milbank	58	52
Mr. Collinson	89	61½
	<hr/>	<hr/>
Total brace	362	281
Picked up afterwards	14	16
	<hr/>	<hr/>
Total killed	376	297
Total of four days' shooting	2,416½ brace.	

On Scargill moor, near Barnard Castle, Sir Charles Clifford, Dr. Daly, and Mr. Walter Clifford bagged seventy-four brace of grouse on the 12th, and thirty-seven brace on the 14th, birds being plentiful but wild. On the Kildale moors, and many others, large bags have been made. Lord Bolton and party shot two hundred and five brace of grouse on the 12th. Disease said to be quite unknown there, so that rents have risen to a fabulous range. Turning to Scotland, we find that at Tulchan, Morayshire, five hundred and ninety-one brace were shot on the 12th. At Huntly Lodge, Aberdeenshire, four guns bagged one hundred and thirty and one hundred and forty-four brace on the 12th and 14th; the same number of guns having nearly the same return at Glenmachie in the same county—namely, one hundred and thirty and one hundred and forty and a half brace. At Moy Hall, in Fifeshire, one hundred and sixty brace fell to five guns on the 12th, and one hundred and twenty-nine

brace on the 14th; and at Finzean, Aberdeenshire, one hundred and fifty brace were bagged by four guns on the 12th. Sir Joseph Pease and party (four guns) killed at Corndarvon one hundred and eighty-one brace, one hundred and fifteen and a half brace, and one hundred and eleven brace; whilst in the Forest of Birse four guns bagged one hundred and eighty-one and a half brace, one hundred and twenty-four brace, and one hundred and two brace.

"Land and Water" reports on 19th August:—"The grouse season of 1882 has so far proved considerably above an average year. Although no sensational bags have been made, it is pretty certain that there is a large stock of grouse, both in Scotland as well as on the majority of English moors. Bags of over two hundred brace have been rare, but those of one hundred brace are comparatively common. The disease has unquestionably left its mark in more than one district, and strangely enough its ravages have been most marked in the opposite extremes of Scotland, Caithness, and Wigtownshire, and in parts of Inverness-shire. It has, however, been found not to be general in either county, but some moors in each have suffered severely. The lower moors of Inverness-shire have escaped, but some of the higher tracts of this grouse country seem to have suffered severely. If possible the weather on the "Twelfth" was too fine, the sun being so bright and the heat so intense it

was dangerous to venture out on the open moors during the middle of the day. Scent seemed fairly good, but a few casts over rough heather under a burning sun quickly settled the dogs in the half-prepared condition they usually are at the commencement of the season. During the week the weather has at times been much cooler, and good bags have been made over dogs. Many of our correspondents write in the most cheerful strains of the sport they have already obtained and still hope to enjoy. On the Lews and the Northern Islands, according to the 'Scotsman,' from whom we have been able to cull some returns to add to the mass of notes our correspondents have so kindly furnished us with, the season is scarcely yet in full swing, as the birds are there generally a week or so later than on the mainland. Regarding Ireland, a correspondent at Cork writes that in Kerry the mountains are literally alive with grouse, and no one to shoot them. This speaks volumes for the present unhappy condition of the country. He grimly asks if it is that grouse is 'too small' a game for shooting in Ireland at the present day?"

The reports that have appeared in the principal Scotch newspapers show that sport has been good throughout the Highlands during the month of August, and well on into September. There were exceptions, of course, as there are every year ; but grouse were exceedingly abundant, as the large supply at the various

markets proved. We are informed that up to the 24th of August there was quite a "glut" in Leadenhall market; that the highest figure was three shillings and sixpence; but that the larger proportion of the birds consigned brought only half a crown each. The following prices are from the returns made by a highly-respectable dealer, for a consignment that reached London on the 14th of August:—"Thirty-six at three shillings and sixpence; eighty-four at three shillings; twenty-four at two shillings and ninepence; one hundred and twenty at two shillings and sixpence; one hundred at two shillings and threepence; eight at one shilling and sixpence: average two shillings and eightpence per single bird." Another ticket, dated on the 22nd of August, gives the following prices: "forty-four at two shillings and sixpence; twelve at two shillings; seventy-two at one shilling and ninepence; twenty-three at one shilling and sixpence; or an average of about one shilling and elevenpence for each bird. As the bulk of the birds which will be shot this year have now been put on the markets, prices will improve somewhat, but as fewer will be shot the money returns will be comparatively small for the sportsmen." In 1881 prices were considerably higher. Like everything else, the rate is regulated by supply and demand.

We have just met a gentleman who spent two months of the shooting season in the Highlands, and he fully confirms our views. He said he never saw

so many sportsmen in the north before, so we presume they appreciate the following lines:—

AWAY TO THE GROUSE.

'Tis pleasant to think of the chance of fair weather,
Of leaving the long-winded bores of the House!
We 're off for the Twelfth, and the gay purple heather—
Away to the Grouse!

Let others talk on in the weary Committee,
Unworthy the labour of Members of *nous*;
Let mad "Bulls" and "Bears" play with Stocks in the
City,
We 're off to the Grouse!

Let Merchants in Lanes, be they called Mark or Mincing,
Drive bargains while striving each other to "chouse;"
Fine scorn for all business our souls are evincing—
We go to the Grouse!

The old dog draws on to where birds must be lying,
And there, at the point, he stands still as a mouse.
A whirr of strong wings! Then the feathers are flying!
And down comes a Grouse;

Then home in the twilight as clouds gather o'er us,
And into the tub we luxuriously souse;
Then dinner! Such prospects make all join in Chorus—
Away to the Grouse.—"Punch."

CHAPTER V.

Diseased Nature oftentimes breaks forth
In strange eruptions.

It is now eighty years since the alarm of grouse disease was sounded in this country. Naturally, its appearance gave rise to much speculation, and many rival theories have from time to time been advanced and published, in the Press and in periodicals, as to its origin. Unfortunately, most of these contributions are from scientists, not from sportsmen, naturalists, and keepers. Hence they are not of much practical value, adding little but perplexity to the obscurity of the subject.

Amongst naturalists, sportsmen, and keepers, great difference of opinion prevails ; the want of positive knowledge, affording in this, as in so many other cases, a wild field for the pranks of pretence and ignorance. But it is, nevertheless, true that men of high attainments differ widely as to the primary cause of the malady. Not a few assert that it has

been imported into this country from abroad, like the rinderpest and the foot-and-mouth disease in cattle. This is palpably absurd, for in no other country does the red grouse exist. Without dogmatising or haughtily disregarding the opinions of those who differ from us, we desire to submit our conclusions as to the cause of grouse disease. Before doing so, however, we shall lay before our readers the views of a few of those whose attention to the subject merits respect.

Among these, we find the name of Dr. T. Spencer Cobbold, author of a pamphlet setting forth his ideas, which form what we may term the *parasite* theory. As this *brochure* has been ably criticised in the "Field" by Mr. William Coloquhoun, of RosSDhu, Dumbartonshire, a very distinguished authority, we cannot do better than give his review in full, after we have quoted a few paragraphs from the treatise itself. The learned doctor believes that grouse disease is caused by a minute organism which he calls a strongle. It is to be regretted that he did not pursue the subject further, and inform us what produced the strongle. Knowing this—the cause—we might be able to think of a remedy. The doctor states in his pamphlet:—

"A question will here naturally suggest itself to the mind of the practical man. Does not the fact of the occurrence of these parasites in the intestines of a so-called healthy grouse destroy the notion of disease

from this source ? My reply is, 'Certainly not.' A large experience with the symptoms produced by entozoa, both in human and animal bearers, enables me to assert with confidence that the measure of feebleness, disease, or suffering usually corresponds with the degree of parasitism ; but not exclusively so, since another factor concerned in the welfare or destruction of the bearer, as the case may be, arises out of the constitutional vigour of the bearer. A strong bird will overcome or resist the irritation set up by the presence of hundreds of entozoa ; while a feeble bird, or one attacked before it is perfectly grown, will more or less rapidly succumb to the invasion. It is the same with mankind. One person will have convulsions from a single parasite, while another will play the part of 'host' or bearer to the same species of parasite without the slightest discomfort. On these and other grounds, therefore, I do not hesitate to express the opinion that the present grouse murrain is due to parasites. The irritation, probable distress, and subsequent emaciation of the birds are readily explained by the presence of hundreds and thousands of strongles ; and the mere circumstance that these parasites are very small, is quite sufficient to account for the fact that investigators have hitherto overlooked them.

"In a paragraph in the 'Times' of May 28, I see it stated that 'the general opinion is that the disease is of a different type from that which prevailed in the

moors some years ago.' It may be so. Let us look more closely to our present evidences. On comparing the results obtained by an examination of the fourth set of birds with those received last year, I could not but be struck with the differences observable as to the degree of parasitism. In the November series, tabulated above, seven of the birds were entirely free of tapeworms; and of the five which actually harboured them, two birds only contained more than two tapeworms apiece. The April birds, on the other hand, all contained tapeworms in more or less considerable numbers; three of the avian hosts being infested to a frightful extent. I sought to ascertain the number of tapeworms in one of these birds, and found that it was not far short of one hundred. The difficulty of being precise as to the number, arose from the quantity of detached heads and necks of the worms, and the fragmentary character of many of the bodies, or strobiles themselves. This, after all, was of no great moment. As to the strongles, they were present in large numbers in all; but, to my reckoning, and speaking generally, scarcely so numerous as in the November birds. At all events, the strongles appeared to me sufficiently numerous to weaken, or even destroy the avian bearers without the assistance of a second kind of parasite; and it, therefore, becomes highly probable that the concurrence of numerous tapeworms sufficiently explained the greater destructiveness of the present outbreak as compared with

that of the previous season. In one extreme case I particularly noticed a remarkably gorged or distended condition of the cæcal villi, such as would result from continual irritation set up by parasites in overwhelming numbers. Careful microscopic investigation showed that there was no rupture of the capillaries, and, consequently, no extravasation in the cæca or in any part of the intestinal canal. That this congested state of the villi was due to the strongles appeared the more certain, since the turgidity was only marked in that part of the cæcum where the strongles were crowded together. With these data before me, I see nothing irrational in the belief that the grouse epidemics of recent years have been due to parasites. To say that these entozoa are merely the result of some cachectic or otherwise impoverished state of the birds, is merely offering a gratuitous assumption resting on no solid basis of fact, and totally opposed to all the experiences of helminthologists. I cannot allow that these tapeworms are merely coincidently or co-ordinately associated with the disease; but I apprehend that the phenomena thus set up are of the same order as those which I almost daily witness in the practice of my profession amongst human bearers. I know, also, that similar diseased phenomena display themselves amongst quadrupeds, especially when the entozoa occur in unusual numbers and happen to occupy sensitive or vital organs.

“The presence of entozoa, it is true, is no proof of

disease. Like other creatures, they have a given territory, which it is their just prerogative to occupy; but when the territory is beset with more occupants than it can comfortably support, then the indications of incapacity duly manifest themselves. Impoverishment, distress, and, finally, destruction of the territory will ensue. This is what sometimes takes place in the human host, and still more frequently in the mammalian bearers; and, philosophically speaking, the bodies of men and animals constitute the invaded territories. In this view, further, the intelligent reader will not fail to perceive that these parasitic phenomena afford another curious illustration of the reality of the 'struggle for existence,' so prominently put forward in Mr. Darwin's work on the 'Origin of Species'; for here we see, as it were, a multitude of Liliputian creatures actively battling for their own existence at the expense of the avian territory. For more or less prolonged residence in this territory they are admirably adapted; their organisation being expressly fitted for the parasitic mode of life. Further on this phase of the question I will not now dwell, but I may add the reflection that since more robust hosts than grouse succumb to parasitism, there need be neither surprise nor doubt as to the fact that game-birds perish under parasitic influences."

Mr. Colquhoun states: "I have just had put into my hands a *brochure* by Dr. Cobbold on the grouse disease, and at the commencement of his pamphlet

I find the following remark: 'Like a certain writer in the "Field" (under the signature of W. C.), they will perhaps say that "when animals become weakened by disease, the parasites increase in an overwhelming degree, and are mistaken by the ignorant for the disease itself."' He goes on to observe: 'That is precisely the position which I for one, after twenty years' diligent study of parasites and parasitism, am prepared to defend against all comers, including the racy writer W. C. himself.'

"Dr. Cobbold is completely mistaken in supposing that I ever held any such views; and how he came so far to misquote me I am at a loss to understand. I never said or wrote that worms in grouse resulted from a vitiated state of the body of the affected birds. What I have maintained for many years, long before Dr. Cobbold took any part in the discussion, and what I still maintain is, that the unwholesome food which grouse have been compelled to eat has occasioned both the worms with which they have been infested, and, at least, one type of the disease.

"I may say that I have read with much interest Dr. Cobbold's remarks, and with all the respect due to his scientific attainments; but he must excuse me for adding that I fail to perceive any new light which he has thrown on the origin or cause of said disease. True, he claims to have discovered a certain species of worm in the intestines of grouse, which he says is a species of strongle, and altogether new to science.

I quite agree with him that *palmam qui meruit ferat* ; but I am convinced, *and can prove*, that he is quite under a mistake in thinking that he is the original discoverer of this little worm. Indeed it would be difficult, I believe impossible, for any man to prove that he was the original discoverer of it. For thirty years at least I have known of two kinds of worms with which dogs, particularly puppies, are troubled, and constantly the remark is made by gamekeepers and others, ‘if it is only the longworm (tapeworm), it will be easily discharged; but that nasty little clinging worm is more difficult to get rid of.’ We all know that the common tapeworm is often comparatively innocuous. For many years (which I can prove by my writings) I have examined the intestines of grouse, and frequently found in them small worms in great abundance; and though Dr. Cobbold may not be aware of the fact, I can assure him that for long every intelligent gamekeeper knew right well that these small worms were most injurious to the grouse.

“Granting then, for the present, the parasitic origin of the epidemic among grouse, I find that Dr. Cobbold blinks entirely in his pamphlet the real matter at issue—the matter of most importance for us to know—viz., what causes these parasites in the grouse; for, without this knowledge, how are we to get rid, or keep rid of them? If the learned doctor is called in, and can only discourse learnedly on the nature

and properties of the worm, what hopes can we have from him of a cure, which is the main thing we want? He scouts the idea of consulting 'the trusty keeper.' 'Of course this uneducated worthy knows all about it.' But, though he writes thus contemptuously of 'the trusty keeper,' he will find that it is the plain practical man after all that knows most about such matters; for seldom, I believe, are the men of science original discoverers. It is, I believe, the plain, practical, and often uneducated man in all such cases who is the pioneer of science.

"For illustration, let me give a case which has just come under my notice, not an uncommon one, and which I think to the point. Some setter puppies were troubled with these same small worms—strongles I suppose we must dub them—and no sooner were they expelled by the usual means than another batch appeared. Now, if we had called in Dr. Cobbold, what would he have done in the circumstances? Judging from his pamphlet, he would have called for specimens of the worms, and no doubt would have discoursed learnedly on their properties and formation, and enlightened us regarding the strobile and proglottides, &c. Now, all this may be very interesting, I allow; but, my dear Doctor, I should be apt to say, What is the cause of the worms in my puppies? That is what I want to know. Here is his answer as regards the grouse: 'In the case of entozoa, an unusually wet season following a

mild winter is eminently favourable to the excessive multiplication of certain forms of these creatures.' Unfortunately for his theory, we have had an unusually dry spring this year; but at any rate, if he has no other advice than that to give, the case is hopeless, for we cannot control the elements. Well, the Doctor may shrug his shoulders, and gape and stare, but all his learning will not account for the infliction of parasites in my puppies, though the little kennel boy has easily solved the difficulty. Between the stable where these puppies were housed at night and the kennel where they were allowed to be during the day there is a sheep walk, and the boy observed that they ate greedily the dung of the sheep in passing along. The cause now of their being so afflicted with worms is plain enough, and a cure easily effected.

"The case of the grouse is precisely analogous. True, we cannot dose the grouse as we do puppies to expel the worms; but we can at least endeavour to secure for them wholesome food, and prevent their feeding on what, for them, may be as prolific of worms as sheep's dung to the puppies. Prevention is better than cure. Assuming, then, that the grouse disease is 'essentially and *exclusively* (?) a parasitic disorder' (which is by no means proved), and that the worms are occasioned by unwholesome food (which I think cannot be disputed), from whom are we likely to get the most reliable information regard-

ing the food of the grouse? Certainly not from the scientific man theorising in his study and longing to be a discoverer. The observant, bare-legged gillie, who traverses the moors from 'matin's prime to dewy eve,' can tell you more about it, if you are not sportsman enough to go and judge for yourself. In 1858 I published a pamphlet on the grouse disease, a copy of which I have before me. I issued circulars to some gamekeepers, requesting answers to certain queries which I sent them on the subject, and the following communication from an intelligent gamekeeper in Perthshire gives as rational an explanation of its origin as any I have seen:—

On the Dalnaspidal Moors, and all neighbouring moors, there was a decided change in the growth of heather within the last six years (writing in 1858):

In year 1852 the heather was in excellent condition.

„ 1853 also good.

„ 1854 damaged from hard frost without the protection of snow.

„ 1855 damaged in the same way.

„ 1856 in an unwholesome state from previous years.

„ 1857 never in finer condition.

“Observe that the years '54, '55, '56 were the years when grouse suffered so much from the disease, and the heather was in such an unwholesome state as he describes. He goes on to observe:—

I. I have examined many grouse's crops, and the only unwholesome food that I discovered was corn.

II. I have dissected many diseased grouse, and found the guts full of very small worms, and the hearts like a drop of dried blood.

“ Here, then, is positive proof of an intelligent gamekeeper finding *very small worms* in the intestines of grouse in 1854, when the disease broke out; but I knew well of the two kinds of worms found in various animals before that time, though I lay no claim whatever to the discovery.

III. The grouse have fed a great deal on the stooks during the disease, and on the stubbles after the corn was stacked, and also in spring on the sown corn. This year the grouse did not come to the corn as in former years.

“ The year to which he refers, when grouse did not come to the corn, was 1858, when the disease had quite disappeared.

IV. My opinion is that corn is very unwholesome food for grouse. Let any person examine the droppings of grouse when fed on corn, and they will find them similar to tar, but rather browner in colour.

“ Now, I can quite confirm this gamekeeper's statement, that the disease appeared in all its virulence after the heather had been damaged by hard frost, without the protection of snow, and that grouse did not show the same rapacity for oats till the disease appeared. Still, I must demur to his conclusion that oats are unwholesome food for grouse *if taken in moderation*. I have had grouse in confinement which throve remarkably well, fed on oats, with a sufficient supply of green meat, which shows that it is only when taken in excess, or probably when they gorge themselves with green or unripe grain, that it is injurious, or produces worms. Or perhaps it would

be nearer the truth to say that grouse were injured by eating the damaged and unwholesome heather; and from the want of a sufficiency of their natural food, they were driven to the stooks or stubbles to satisfy their hunger, though no doubt gorging with oats to such an extent could not be otherwise than injurious. At all events, I have shown that not till the heather, their natural food, was damaged and unwholesome did the disease appear. But the crying evil, after all, as I have been arguing in the columns of the 'Field,' and otherwise through the Press, for a considerable time, is undoubtedly the overstocking of the moors with sheep. Pasture the increasing stock of sheep must have, and that can only be supplied at the expense of the grouse. Not more necessary is good pasture for sheep or cattle, or grain for the use of man, than is sound and wholesome heather for the sustenance and nourishment of grouse. I will not trouble you with statistics, though I have some by me, to show the enormous increase of sheep on the moors within the last thirty or forty years, from the opening up of the Highlands, and the facilities of communication by railroads and steamboats. Take almost any good grouse moor in Scotland for an example. Twenty years ago, perhaps, that whole expanse bloomed with the purple heather. Twenty years ago that stock of sheep—that crowd of white moving specks which you see dotted over the mountain side—could not have subsisted within their

present boundaries. What has been given to the sheep has been taken from the grouse. Now, the natural course to pursue would be, as you diminish the food of animals under your care, the numbers of animals to be fed should be proportionately restricted. But strange to say, with a fanaticism which can scarcely find a parallel, just as their natural means of subsistence is being so extensively curtailed, sportsmen are endeavouring by every means in their power excessively to increase their numbers. The result is inevitable. When deprived of their natural means of subsistence they are put to their shifts to maintain life; and yet men wonder what can cause their intestines to be so crammed with worms, and that disease should periodically decimate their numbers. The wonder would be if the case were otherwise. Deprive any animal of its natural food, and feed it on what may be to it unwholesome, and disease will inevitably ensue. We don't require doctors or scientific men to teach us that. Now, I can honestly say, without any exaggeration, that in some late springs I have seen moors, not only without a bush of wholesome heather, but without a single green blade of any kind upon them. In the name of common sense, then, I ask, do we require any other cause to account for disease in grouse? or, if Dr. Cobbold prefers the circumlocution, the little worms dubbed strongles, which occasion disease?

“The following question was put to me some little

time ago: 'Can there be any doubt now that frosts and cold winds have more to do with grouse disease than over-stocking?' My friend will, I hope, excuse me for saying that he has propounded a very simple question, and by no means difficult of solution. No doubt the seasons have changed very much from what they used to be twenty or thirty years ago, and grouse have materially suffered from cold late springs, which have blighted the heather. Dr. Cobbold sneers at such an idea, but it only shows how little real practical knowledge he has of the subject. 'How exquisitely simple! How satisfactory! What logical reasoning! East and north-east winds we have had in abundance; but these, it is clear, will hardly account for the murrain alone, so in comes the old stereotyped phrase about the "blight."' Nothing, in short, will satisfy the learned doctor which seems to interfere with the parasitic origin of the disease, as he lays claim to the discovery of the internal parasite in grouse. But granting, as I do, that this nasty little parasite does occasion disease in grouse, is there anything illogical in attributing the cause of the worm to the bird being compelled to eat unwholesome food, from its natural food, the heather, being damaged or destroyed from continued blighting east wind? And thus the blight of the heather is really at least one cause of grouse disease. True, it has been rejoined, that occasionally disease has appeared when the season has been most pro-

pitious for vegetation; but if sheep and grouse have alike been unduly increased on any moor, as I have before shown, and both are greedily competing for the nice green young shoots of heather, it requires no conjuror to predict which of them must go to the wall.

“I appeal, then, to every true sportsman who is familiar with the moors at all seasons of the year, and has particularly studied the habits of grouse, and not like the writer of this pamphlet, who confesses to having not the ‘slightest title to be called a sportsman,’ and only not ‘altogether unfamiliar with the habits of game,’ and that he *has* ‘shot over moors in the counties of Selkirk, Peebles, and Kirkcudbright.’ I say, I appeal to those who are familiar with the abodes of grouse at all seasons of the year, whether it is not clear as demonstration that insufficient or unwholesome food is the cause at least of one type of disease among grouse. But the question still arises—Have we not had two types of grouse disease Dr. Cobbold evidently does not admit this when he says ‘the disorder is entirely parasitic.’ All I can say is, that in the earlier stages of the grouse disease the attack was much more virulent, and the birds being found dead and dying in such numbers by the watercourses—which latterly was not the case—gave unmistakable indications of a febrile affection. The plumage of the birds also presented a different appearance in the earlier attacks, the feathers having a dirty

or dragged look about them, which latterly I have not observed in diseased birds. There is a treatise by Dr. Alexander Smith, of Edinburgh, printed for private circulation, on 'Fever and Cholera,' in which he attributes all remittent and intermittent fevers, including cholera, to the malaria type, which he holds to consist of emanations of material particles from imperfectly-drained soil, reaching the nervous centres by absorption through the lungs. This, I take it, is very much the atmospheric theory. But if we come to epidemics, I suspect their true pathology is to this day among the *questiones vexatæ* of science. But whether there are different types of grouse disease or not—whatever may be the special cause or combination of causes which produce it, we have but one remedy to apply.

“Of course we cannot use the same artificial means with wild as with tame animals—we cannot control the elements; but common sense may point out that we should at least endeavour to have their natural food—the young shoots of the heather—as wholesome and sufficient as possible, and their abode dry. That, at least, is my hobby, and

Each man's hobby, of course,
Is his galloping horse ;
He believes there 's no steed of such mettle or force ;
And when he 's astride
Of his hobby, he 'll ride
Just as wildly as I do on my hobby horse.

If you ever endeavour
To stop him, you 'll never
Succeed in persuading him out of his course ;
He thinks he 's so clever,
No logic whatever
Can reason him down from his own hobby horse.
That 's his galloping horse,
That 's my galloping horse,
That 's yours, mine, and every man's galloping horse.
And we never can meet
With a tune half so sweet,
As made by the feet of our own ' hobby horse.'

Further comment on Dr. Cobbold's pamphlet would be superfluous, were it not that it has enlisted wide sympathy among those who have some knowledge of grouse and the northern moors, and among others to whom the disease is unknown.

A well-known member of the faculty, Dr. Robert Farquharson, disputes the Cobbold theory that the malady is entirely parasitic, and believes that a contagious epidemic better explains the various phenomena. He is of opinion that the idea of an epidemic and infectious fever fits the facts already obtained better than anything else, and that this has at all events the advantage of the possibility of suggesting a remedy. The learned doctor does not stand alone in this view of the matter, as many persons whose opinions are worthy of respect think that the mysterious nature of the grouse disease places it within this category.

Dr. Farquharson says that he is forced to confess

that, notwithstanding the laborious investigations of later years, we know little of the origin and natural history of cholera ; and, although we may all claim a certain superficial acquaintance with scarlet fever or measles, who will venture to assert that we have any knowledge of the way in which they spring up quite unexpectedly from time to time, or the laws which regulate their relative severity under apparently similar conditions ? Whilst these phenomena remain unexplained, he says, we need express no surprise that we can at present do no more in connexion with the subject than use a phrase which does good service on many similar occasions, and say that some epidemic influence is at work in devastating our moors. He holds that the capricious nature of the attacks argues in his favour, and no doubt it does in a very great degree, for we certainly find that the disease skirts as it were the very limits of a particular moor one year, returning another year to devastate the tract which it left untouched before. Moreover, he argues that as great differences prevail in the degree of loss of flesh observed, some dead or dying birds being found as plump as in their healthy condition, whilst others are found reduced to mere skeletons, this is in favour of its specific or constitutional nature. This difference, he thinks, depends on the dose of fever poison imbibed, so that whilst those dying from a very acute attack, or whose constitutions are unable to withstand its debilitating influence for more than a brief period,

retain the outward appearance of health, others present all the indications of excessive exhaustion. We have ourselves frequently picked up dead grouse, perfectly plump and in excellent plumage one season, and on the next season found diseased birds with attenuated bodies and dull disordered plumage. These had, however, died of diseased liver, which we found in every case black as ink, soft, and wasted. We are now, as we were then, of opinion that this unsound condition was the result of the birds feeding on old, dry, and hard heather, their crops being full of it, and undigested.

An excellent authority on the subject is Mr. John A. Hawie Brown, F.Z.S., of Dunipacé House, Stirlingshire, who kindly favoured us with his views in September last. He believes, in common with many other naturalists, that grouse disease is caused mainly by over-stocking, over-preservation, and the complete and indiscriminate slaughter of certain species of so-called vermin, notably the peregrine falcon ; also by the state of the young and old heather after severe and late frosts, which affects the degenerate stock more than in former years, when grouse were less numerous, but healthier and stronger, having a larger area of feeding-ground. Although there are many more sportsmen now, they do not adequately make up for the increased number of birds. We give the rest of the communication in Mr. Brown's own words.

“Long ago the lairds and their friends alone shot over the moors, and were content with smaller bags. Now sportsmen who pay high rents want larger bags, and cram into a week’s shooting what used to be the whole season’s sport. As a consequence, many more birds are wounded, perhaps in the generative organs, or other parts, which wounds affect their constitutions, and if they survive, they probably breed weaker-constituted birds. Before all peregrines were shot down and trapped and destroyed, these weakly birds were picked off, being usually the easiest captured, the last of the covey or pack in flight. How many authentic instances can you give of grouse disease appearing to any alarming extent, or at all, in deer-forests? My belief is, but I do not speak with data at my side, that if you investigate this part of the subject, you will find very few authentic records of grouse disease in the deer-forests of Scotland. Why? Because peregrines, martens, wild cats, and ‘vermin’ are *not* slain indiscriminately in deer-forests, and the grouse there lives a more natural existence.

“Formerly birds were less plentiful, more healthy, and men were less greedy. Now grouse are swarming, and a most unnatural state of things exists; and not pleased with this, even, men want more and more, and grudge a single bird to feed the falcon’s young. As long as they do so, so long will grouse disease recur. A direct cause of rapid increase of grouse is in the regular system of burning heather, a better

succession of young fresh food being supplied, but the natural outcome of this is that when *late* and severe frosts do come, as they so often do in this country, a much larger area of good feeding ground is damaged. If there were less young heather, there would be fewer birds, I believe; but when late frosts did come, these late frosts would be less likely to do damage on a large scale. If we must have at the rate of fifty to one hundred birds per acre on our moors (I do not speak from statistics) we must burn our heather judiciously and well; if we have this unnatural stock one year, we must not be surprised if the following spring a severe late frost damages or destroys all our fine stretches of tender young heather, and, consequently, that our grouse become diseased. Formerly, I believe, when heather-burning was not so common, the young heather came away, to a limited and natural extent, beneath the old heather, which latter, to some considerable extent, protected it from the frosts of spring. Now the 'young heather' is 'forced' up by the burning, and it has no protection at all, as formerly. Much more I could say in support of what I have already said, but to me so self-evident seem the causes, and the whole sequence of the facts connected with the grouse disease, and so certain am I, that I shall in the main issues be supported in what I say by those naturalists whose opinion is most worth having, that I do not think it necessary here to bring forward further proofs and

statistics; but simply to repeat, that the first causes of grouse disease are to be found in over-stocking, over-preservation, ignorant and reckless slaughter of so-called vermin, greed, unnatural and rapid burning of heather, and a wholly artificial state of grouse farming. In different districts these causes may differ to some extent. In the west, for instance, if too large areas of heather are destroyed, where young heather takes three or four years to re-appear, or is entirely supplanted by ling and grasses, and where the hill-sides get pitted and worn into cup-shaped holes by the naturally wet climate and great rainfall, holding thus much moisture, then grouse do not increase in numbers, but become extinct or scarce, owing to the scarcity of natural food, and then, perhaps, the outcry is made, not against the interference with Nature's laws in this direction, but against the superabundance of 'vermin.' Again, in Perthshire or Banffshire, or other localities where young heather rushes up as if in a hot-bed after the old heather is burned, in a single year, or at most two, and remains good for several years, the results are different, and a large stock of grouse appears. But if the *whole* heather were burned at once, and severe late spring frosts came, so would the whole young heather some fine day be destroyed, and probably the grouse become extinct on larger areas. In a country where grouse are scarce, the evil may arise from interbreeding; and, indeed, this evil may even be a

factor on densely-stocked moors, strange as the assertion may at first blush appear, because on densely-stocked moors the interbreeding may only be less in degree, as this large stock has been produced to an *unnatural* extent upon an area calculated by Nature to contain a far less quantity. In sparsely-populated districts a judicious introduction of fresh blood is necessary, and even on densely-populated moors exchange of a few hundred netted brace for others from a distance would decrease the chances of disease, though I doubt if it would cure or entirely prevent it."

The following letter will be read with great interest as coming from so distinguished an authority:—

Rossdhu, Luss, Dumbartonshire,

MY DEAR SIR,

August 18th, 1882.

I HAVE little to say about the grouse disease except what I have frequently said in the 'Field.'

If you were asked what was the cause of cholera, you would at once reply that there were various causes. Bad ventilation, bad drainage, unwholesome food, besides atmospheric influences. Any of these causes might account for cholera. So it is with the grouse disease *par excellence*. It may be caused from various influences. It has been observed to break out after an over-increase of stock on a moor, and thus some have leaped to the absurd conclusion that over-crowding is the cause of disease. Now, we must distinguish between over-crowding and over-stocking. To talk of over-crowding on a breezy hillside is absurd. But the Malthusian theory must ever hold true, and if you over-stock beyond the means of an animal's natural subsistence, the inevitable result must

follow. The causes of epidemics or epizootics are frequently not discernible, but I have all along been of opinion that unwholesome food has in nine times in ten been the cause of outbreaks of disease in grouse, though, like human beings, or all animals, they are susceptible of atmospheric influences. As, then, ventilation or drainage can have nothing to do with disease in grouse, as with domestic animals, I hold that there are but two known causes which may account for it—unwholesome food and atmospheric influences. As regards the first—unwholesome food—there are various causes which may deprive grouse of their natural food, heather, and thus compel them to resort to that which is not wholesome. A long-continued blighting east wind, without rain, may for a time ruin the heather. Or, after careful burning, if there is such a stock of sheep on the moor as to crop up all the young sprouts of heather on which grouse thrive and subsist, what is there for it but for the poor creatures to forage for what they can get to fill their crops? Hence the first sign of disease is to see them on the low grounds, in the potato fields, or gorging to repletion on unripe grain.

I hold, then, that nine times in ten unwholesome food is the cause of grouse disease *par excellence*, though grouse are liable, like all animals, to various diseases. But I know, in answer to this, that it has been said that the disease has appeared on moors when the heather has been in the best state for grouse. Well, then, I freely admit that, when that is the case, the cause of disease is more inscrutable, and so, I can see nothing for it but to fall back on my other theory—atmospheric influences. At least, I could suggest no other cause, and have seen or heard of no other, except contagion or infection.

It is a curious fact, which I think throws light on my theory of unwholesome food being the chief cause of the grouse disease, that in my young days, fifty years ago, grouse never left the moors or frequented the stubbles; but now, in a late harvest, the moor-edged farmers are quite afflicted by the grouse feeding on their “stooks” of corn. I can only account for this change in their habits from the fact that formerly the moors were less

stocked with sheep, and therefore there was more of their natural food for the grouse.

I quite believe that if the heather disappeared in our country—and I think there is every appearance that in time the green will usurp the purple—that grouse would disappear too. But it is a mistake, nevertheless, to suppose that grouse cannot subsist without heather. I have proved it to be so. Some time ago we kept tame grouse here, and I sent a pair to a friend in Suffolk. On the way there the hen laid several eggs. These were set below a barn-door hen, were hatched and reared, and lived in perfect health for at least four years, without ever tasting heather, though supplied with plenty of green stuff and weeds which they liked. Like most such pets, they came to an untimely end by a cat getting at them and killing them.

I don't think I can add anything to what is well known regarding the management of moors. It is the common practice now to burn in strips and by rotation. As for food and shelter, the sportsman must square the matter of food between the sheep and grouse, for there must be enough of young heather for the grouse or they cannot thrive; albeit what I have said about the grouse in Suffolk. As for shelter, grouse will take care of themselves. I would prefer burning to mowing old heather.

If I can give you any other information on this subject I shall be happy to do so.

I am, yours faithfully,

WILLIAM COLQUHOUN.

The Earl of Morton writes to us from Conaglen, Ardgour, Argyllshire, that there never has been any disease amongst the grouse there. His lordship thinks that the reason is that there are so few of them, the grounds never being over-stocked.

General Macdonald, of Edinburgh, believes that the cause of the disease in grouse is a small species of

tapeworm dropped from sheep, probably in an embryo form, or from dogs, and taken up by the birds in their food and the water they drink.

Major J. Murray Kennedy, of the Holme, New Galloway, Kirkcudbrightshire, states that the grouse disease seems to come after very good years when there are more birds left on the moors than usual.

Colonel J. S. Stirling writes to us from his estate, Gargunnock, Stirlingshire:—"I believe the cause of the grouse disease is the over-stocking of the moors, or rather the leaving of too many birds at the end of the season, and that the remedy for it, now that the keepers have killed off the natural enemies of the grouse in the shape of hawks, &c., is to shoot them well down, keeping at it well on in the season, and, if necessary, driving them. Driving, also, has this advantage, that it kills off the old birds, who always fly first, and who are very quarrelsome, and do a deal of harm in the nesting season."

Dr. W. G. Dickson, of Mougbaie, Dalbeattie, writes to us:—"My idea is that the tapeworm has become very common among grouse, as among other animals, that the worm becomes more common as numbers increase, and birds die of inanition from the presence of the worm in the body, and then birds die very thin, skin and bone. In these years of plenty, the worms are passed out of the bodies on to the heather, and the young birds pick up the segments and eat them. The eggs of the tapeworm thus enter

the body, and, working through the tissues, as we know that eggs and young of parasites do, either seat themselves in the liver, or some other organ, and act fatally without impairing the appetite or injuring the healthiness of the birds; and these die somewhat suddenly while plump and full, and with a full crop; and thus the numerous birds of one season become nids for the propagation of these parasites, and so dying off, leave the moor once more to the few that have not suffered from the worm or are able to withstand it and live over a season."

Mr. T. Watson Greig, of Lassintullich, Rannoch, Perthshire, writes to us:—"I had grouse disease some years ago on a moor in the west of Scotland, and the mode pursued was to kill and bury every bird we could find. It did not occur again, and the moor yielded a large increase, about double the number previous to disease. I purchased this moor in 1879, and have had no disease. There are always a certain number of birds die in spring, and where driving is indulged in this number is largely increased, and no doubt this is sometimes mistaken for disease. I try to shoot as many old cocks on the 12th as possible, and this moor, eight hundred acres, which formerly yielded about forty brace, now gives about ninety brace. It is my opinion capercailzie and black game interfere injuriously with grouse, if in large numbers."

Mr. William Houstoun, of Kintradwell, Brora,

Sutherlandshire, writes to us: — “As to grouse disease, I have been amongst it, and watched its various phases all my life, and nearly thirty years ago corresponded with the ‘Field,’ when the disease first became serious in this district. At that time it took the tapeworm type, and the birds all came down to the sea rocks to pick up particles of salt evaporated by the sun. Salt, being a cure for tapeworm, was suggestive, and I placed rock salt on the moor; but when the disease next appeared it had a different form, and I fear we are as far as ever from a solution of the cause. That it comes at regular cycles there cannot be a doubt, and although it has this season, 1882, only been partial as yet, I feel quite convinced it will spread. I do not believe in over-preservation being a cause, for the moors in this district and the one I rent myself are terribly affected now, and they have always been well shot down. I opened three birds this week in the last stages of the disease, and they all presented the same appearance. The liver like a clot of coagulated ink; intestines extended with a feculent yellow matter, and crop full of undigested but fresh and green heather tops.”

Mr. W. J. McHaffie, of Torhousemuir, Bladnoch, Wigtownshire, writes to us: — That he believes the disease to be attributable to atmospheric influence, attacking grouse periodically, just as influenza, cholera, diphtheria, &c., visit the human being. That an experience of many years has satisfied him that the

theories as to the disease being caused by grouse eating old heather, too much corn, or the total want of it, are all incorrect. Over-stocking is, as a matter of course, injurious to grouse, not that it tends to produce this particular epidemic, but simply because when too many animals of any kind are congregated together they become unhealthy, and less able to resist the attacks of this disease when it makes its appearance.

Many more extracts could be made from the numerous letters we have received on this subject; but as sufficient quotations have been given to show the prevailing opinions as to the causes of the disease, and as we shall have occasion to notice more of the rival theories in our concluding remarks, we will now turn our attention to the published views of those who have from time to time endeavoured to solve the question.

There is a paper in the first volume of the Natural History Proceedings, Glasgow, by Professor John Young, on certain aspects of the grouse disease, in which he records the result of several observations he had made while dissecting grouse, with a view to ascertain the cause of death. He found a portion of the small intestine completely plugged by a dense mass of tapeworms. He also described the appearance presented by three other specimens of grouse, which had died of the so-called grouse disease on a moor in Argyleshire. In all there was extensive inflammation

of the peritonæum ; in three, more or less adhesion of the intestines to each other and to the abdominal walls ; in two, perforations had taken place through the adherent surfaces, the length of the tract from gizzard to anus being thus reduced. In these last two (red grouse) tapeworms were abundant ; of the other two (black grouse) one contained only a single tapeworm, the other was wholly free of them. The two species were further contrasted : the intestines of the red grouse presented their normal calibre, their muscular substance being softened (this being probably a pathological condition, though possibly increased by post-mortem change), whereas those of the black grouse were very much dilated and translucent. Moreover, of these two the younger presented the earlier stages of peritonitis, granules of lymph occurring in patches over the surface. Professor Young considered these appearances as supporting the view that the disease in no way depended on the presence of the entozoa, but that the peritonæal inflammation was the true cause of death. Having had opportunity of examining fatal cases in different parts of the country, he had come to the conclusion that the mortality is not dependent on local conditions, but that the disease is the result of some general cause operating equally on birds placed under very serious conditions. The mortality is, in fact, due to malnutrition, to a cachectic state transmitted from parent to offspring, and predisposing the young to suffer

from influences such as severity of seasons or temporary scarcity of food, which under other circumstances they would have resisted successfully. Concerning the cause of that cachexy, Professor Young had not formed an opinion—had only observed its relation to the amount of shooting over certain moors. An explanation had been given by Mr. Gray, which seemed to meet all the difficulties of the case, being founded on the history of the species in time, and in the peculiar circumstances in which the birds are placed in this country. Professor Young concluded by asking for further specimens from those who might have the opportunity to send them, with a view to the preservation of a suite of specimens, illustrating the stages of the disease.

Mr. Gray, the Secretary of the Natural History Association, observed that in reviewing the widespread ravages of this disease, it was necessary, before forming a judgment, to consider the changes which over-protection had brought upon the life of the red grouse. The almost total annihilation of its natural enemies had, to a certainty, induced a greater number of sickly birds, and ultimately a weaker race had sprung up in districts where formerly only strong birds prevailed. Buzzards and hawks, &c., if allowed to live, would have captured both the sick and wounded, and thus have prevented the perpetuation of a degenerate breed; and if sportsmen would only content themselves with a moderate bag, and allow

part of the feathered stock on their moors to become the prey of animals ordained by Nature to play an important part in their own particular sphere, we should have fewer instances of disease to chronicle. Nature in her arrangements (continued Mr. Gray) is very nicely balanced, but when, by man's interference, that balance is deranged, it is impossible to calculate the evils that may follow. The red grouse, therefore, wholly confined as it is in its geographical distribution to the limited range afforded by the mountain tracts of the British islands, is in a somewhat perilous position as a species. Rigorously protected for two-thirds of the year, it is suddenly subjected to a destruction which has almost no parallel ; and, looking to these periodical outbreaks of disease, combined with this annual slaughter through which the bird passes, it does not seem inconsistent with common sense to predict its extinction altogether. In the struggle for life, certain species have been known before now to be restricted to narrow limits before their final disappearance ; and, bearing this fact in mind, it would be well for the holders of moors to consider the propriety of trying some other plan for prolonging the life of this fine bird, than the very questionable one now in force.

The Rev. Canon Tristram, F.R.S., College, Durham, stated, at a meeting of the British Association, in a paper on the Zoological Aspects of the Grouse Disease, that he attributed the rapid extension and

epidemic character of the disease in a great measure to the indiscriminate slaughter of predatory animals. These, it was true, destroyed game, but it was only of the weakest and the most diseased animals that they made their prey. In this way nature stamped out disease, a method successfully copied in dealing with the cattle plague. He commented severely on the encouragement given by landed proprietors to the destruction of birds and beasts of prey, complaining that upon this question game-preservers were more open to be influenced by ignorant gamekeepers than by naturalists.

We find in the "Edinburgh Medical Journal" an article on the grouse disease by Mr. Andrew Wilson, Lecturer on Zoology and Comparative Anatomy, Edinburgh. This gentleman believes that the true mode of investigating the subject lies in the direction of pathological inquiry. First to ascertain the nature of the lesion; thence, if possible, to determine its cause; and, conjointly with the latter point or separately, to suggest from our pathology the means for prevention and cure.

Mr. Wilson has had many opportunities afforded him for the examination of grouse dying from the disease, and, although he does not venture to pronounce with certainty upon the exact cause or nature of the fatal lesion, he has briefly detailed the results of his investigations. He states that, in most of the birds he examined, he observed a markedly congested

appearance of the mucous surface, and of the digestive and respiratory tracts. Repeated dissections and careful observation satisfied him beyond doubt, of the almost invariable presence of this lesion in birds which were forwarded as having been found dead. These appearances were especially marked in three cases, the specimens of which were obtained through Professor Simpson, of Glasgow, and he was careful to determine that these appearances were not due to putrefaction or post-mortem changes. He observes, with reference to two of the theories advanced in the controversy on the grouse disease, as follows:—

“The first of these hypotheses is generally associated with the name of Dr. Farquharson, of London, who maintains that the lesion or lesions partake of the nature of a *contagious epidemic*, propagated by association or contact, and which, like epidemics in general, are presumed to have their origin in conditions of a more or less determinable kind.

“The second theory, which has Dr. Cobbold for its chief exponent, may be termed a hypothesis of *parasitism*. Dr. Cobbold’s researches on entozoa and helminthology justly entitle his opinions on those matters to be received with respect; and he accordingly maintains that the grouse disease has its essential feature in the growth and propagation within these birds of parasites or entozoa; the result being to produce the ‘pining’ condition, with the sequelæ of inanition, disease, and death. The chief parasite, or

that to which the diseased condition is thus presumed to be mainly due, is a round worm of small size—the *Strongylus pergracilis* of Cobbold—which appears to select the cæcal appendages of the intestine as its abode. In the cæca these worms are met with sometimes in very large quantities. The grouse tapeworm, *Tania calva*, is also commonly present in the intestines; but I do not apprehend that the parasitic theory attaches to the tapeworm, of itself, any grave or responsible share in the production of diseased conditions.

“Of these two theories I must unhesitatingly prefer the former; and the reasons for enlistment under the banner of the epidemic hypothesis rather than under that of parasitism, are chiefly those derived from the consideration that the former theory fully comprehends *all* the conditions which the phenomena of the grouse disease may present; and further, that the theory may be applied to the explanation of points and facts, of which the theory of helminthiasis can take no heed.

“We thus find that these birds are almost invariably affected by both kinds of entozoa; most specimens to a moderate extent, some to a very great degree. But it is exceedingly rare to meet with a bird in which not a single parasite of either kind is present. Out of many cases examined not a single bird was found actually free from the characteristic tapeworm, and in one or two doubtful instances only could it be

asserted or suggested that none of the round worms were present.

“ That the presence of these parasites was unconnected with the death of the great majority of the birds examined is, I think, proved by the want of any causal or obvious relationship between the infestation and the fatal issue; and also by the absence, in most cases, of the signs of fatal parasitism—such as inanition, producing the ‘ pining ’ condition, actual perforation, morbid appearance of the muscular tissues, &c. No one can deny that the presence of parasites in large numbers undoubtedly causes death in a specific and readily understood manner; but this fact will not explain the nature of the cause or disease which operates so fatally, *without any exceptional development of parasites*, and certainly without the slightest appearance of inanition or other concomitant symptoms of helminthiasis. Outside the parasitic hypothesis, applicable as that theory is to a certain class of cases, there lies, I am convinced, the great bulk of fatal instances, the exact cause of which fatality must be sought for in some lesion analogous to that involved in the idea of the epidemic theory. We must thus account for the death in numbers of grouse which, with what one may consider a normal and natural degree of parasitism, yet die and succumb to disease, and which on examination present well-nourished bodies, firm, healthy muscular tissue, and other signs of presumed health.

“Conversely, the lesions found after death, as exemplified by the foregoing observations, are perfectly compatible with the theory and suggestion of a contagious epidemic disease, which runs through a defined course, and which, could the animals be observed during life with the requisite degree of care and attention, would probably be found to exhibit a symptomatology analogous to that of an acute febrile attack. And this view may receive some support from its serving to explain the varying degrees of intensity in the appearances observed on dissection, by presuming that the attack may terminate fatally at various stages in its course; or that the less marked appearances seen in certain cases may be consistent with symptoms of resolution and amendment.”

Our esteemed friend, the late Mr. John Keast Lord, naturalist to the British North American Boundary Commission, author of that charming book, “At Home in the Wilderness,” wrote several articles on the grouse disease in “Land and Water,” in 1867, when the malady was very prevalent. He thought then that the grouse disease belonged to the same category as cholera and rinderpest, but he advanced no opinion as to the origin of it. He assumed that the germ of the contagion floated in the air or in water, and was taken into the alimentary canal with the food. While discussing the subject since with him and another high authority, Mr. Frank

Buckland, he yielded very much to our views that an unhealthy growth of the herbage, upon which grouse mainly depend for subsistence, was one of the causes of, or at least predisposed them to, the disease. The results of the *post-mortem* examinations that were made from time to time by Mr. Lord and Mr. Buckland appear to have confirmed their idea, that the disease was disorganisation of the liver accompanied with inflammation of the chest viscera. They were of opinion that "stamping out" was the only means of putting an end to the further spread of the pestilence—that every sick and weakly bird should be shot and buried with some disinfectant, or put into a pit with quicklime. We think that there is far too great a tendency to ascribe the origin of all diseases to living germs and organisms, while other and more satisfactory explanations are at hand.

Having now put before our readers the various opinions of scientists, sportsmen, naturalists, and others, on the grouse disease question, we will make some concluding remarks.

CHAPTER VI.

Attempt the end, and never stand to doubt ;
Nothing 's so hard but search will find it out.

ALTHOUGH the grouse disease, its causes, and the means of remedying it, appeared at first exceedingly perplexing, we have, we think, cleared up the seeming mystery in the foregoing pages. The investigations made by us many years ago on the subject left no matter of doubt in our mind. Lest, however, it might be thought that we are only adopting the opinions given in the preceding pages by others, we will reprint the views entertained by us many years since, and which we published in the Press at the time. In 1856 we expressed the same views as we do now. Although we have lost the paper, the following extract from it, however, is to be found at page 717 of our work on "British Columbia," issued in 1863. In writing about the birds of that country

we referred to grouse in Scotland, and the disease, as follows:—

“The disease which has prevailed amongst grouse is said to be almost as mysterious as the potato blight; and nothing that has yet been written about it has satisfied us of the causes which led to the disappearance of birds from the best-stocked moors a short time ago. We are of opinion that the passion for inordinately large bags, which has been indulged in on moors not let under lease, and the unceasing demand for the southern market, has led chiefly to the scarcity that existed. No stranger has the same interest in preserving game as the owners, who have a love for sport; but we regret to say that these have become few in number, and that exploring the fastnesses of the Highlands is all but relinquished by our own country gentlemen. The paucity may also be ascribed to the decreasing number of the fox, and to not burning the overgrown portions of the heath each successive year; for when the heath becomes rank, the young birds, being caged in, are unable to move away for food, and are frequently found dead in their nests.”

We wrote our opinion in “Bell’s Life” of 16th June 1861, from which the following is an abridged extract:—

“Although many persons may not feel disposed to attach much importance to the opinions of the aborigines of British North America, it may never-

theless be a fact worthy of mention that the notions of the Indians with whom we have conversed as to the cause of the disease of the grouse, in British Columbia and Vancouver's Island, entirely accord with the reason assigned by us. These enemies of the feathered fraternity say that the grouse of these rigid, inhospitable dependencies subsist mainly on seeds and berries, and on several species of evergreens; in early spring they eat the tender buds of various trees; then when the winter has been more than commonly severe and the spring cold, the leaves and buds of the trees and shrubs lack the nutrition necessary for the healthy condition of the grouse, and, consequently, disease is engendered, of which they speedily die. So also of our Scottish moors; the severity of our winters is at times very great, and the same result follows."

Our view as to the cause of the grouse disease was confirmed in "Land and Water" in 1867, in which the following facts were submitted to the judgment of sportsmen:—There are two moors, one in Inverness-shire, one in Aberdeenshire; the distance between the two, as the crow flies, is probably not more than forty miles. The first-named moor contains forty thousand acres, the second thirty thousand. On the first there has been no disease, and more than two thousand brace of grouse, in the best possible condition, have been killed this season, and a large stock of healthy birds have been left to

breed ; on the second moor, although in ordinary years between two and three thousand brace of grouse have been killed, this season not one bird has yet been shot, because the disease has prevailed to such an extent that few grouse are left. What has been the reason of these different results ? is the important question to be solved ; and in what respect does one moor differ from another ? and was the weather similar in the spring of the year, or was it in any important respect different ? and if so, what effect did that difference produce on the heather ? On the moor on which the disease has prevailed, the keeper states that the last spring was one of the very worst he has ever known since he has been on the ground ; and his experience extends over seventeen years, in addition to about ten years' prior experience on other moors. There were continuous cold, sharp, cutting easterly winds, with occasional sleet and snow-storms, and the heather became hard and sapless ; this having been the invariable consequence of similar weather since he has been on the ground. He therefore infers that hard, indigestible, sapless heather has been to a great extent the occasion of the disease ; especially as, in every instance, on opening a diseased bird, he has found the liver black and soft. One striking difference between the diseases of 1867 and that of former years, he states to have been, that the dead birds he has picked up this season were so plump, and in such excellent plumage, that they had the appear-

ance of healthy birds; whereas in former years the diseased birds were mostly characterised by dull disordered plumage and attenuated bodies.

The following letter from us appeared in "The Times" of May 12, 1873:—

SIR,

The unsatisfactory accounts of the moors which continue to reach us from the north of England and Scotland are very greatly to be regretted. It seems that disease of an exceedingly virulent kind prevails in almost all parts of the Highlands, and in a form hitherto unknown. This heightens the mystery and renders it more incomprehensible than ever.

The striking dissimilarity which marks the disease in different years may not be altogether unworthy of notice at the present moment. In 1847, 1856, and 1865 the infected grouse exhibited a dull, disordered plumage and attenuated bodies. In 1867 they showed good plumage, a healthy appearance, and were perfectly plump, although the liver was discoloured and soft. This year they are beautiful in plumage, but wasted to skeletons, having large quantities of undigested berries and old heather in their crops.

Now, Sir, if I am asked to account for these remarkable differences, I really cannot do it, although, however, I have not much hesitation in advancing my humble opinion as to the causes of the disease. Well, then, I attribute it in a great measure—Firstly, to not burning or mowing sufficiently extensive patches of the old heather in the best feeding-grounds, to insure an adequate supply of young, tender heath-shoots for the bird's food, and cover of different ages for their protection in winter and for the breeding season; because rank heather and decayed fibres, old seeds and berries, lack the nutrition necessary for the healthy condition of the grouse, and do not assimilate with the system of the bird, consequently germinating disease, of which the creatures speedily die. Secondly, to the over-stocking of the moors, and to overtrapping birds of prey;

because over-stocking helps greatly to develop all sorts of maladies, especially parasitic diseases, while birds of prey contribute to the health of the live grouse by destroying the weak, sickly, and later-hatched birds, and such as get debilitated from other causes, and thus leave, though a smaller, yet a stronger, hardier, and healthier stock.

Nothing that has yet been written or said about the grouse disease will induce me to abandon my belief that it is due in a great measure to the causes I have just stated, and I have been all my life more or less resident in grouse districts in this country and abroad. Moreover, I have not only shot thousands upon thousands of them, but I have also dissected many, and I found my conclusions upon my experience.

I am, Sir, yours faithfully,

D. G. F. MACDONALD.

We might quote many more letters written by us since 1873 on this subject; but we have given sufficient to prove that our views are of long standing, and are not based on information recently furnished to us by others.

Since we have arrived at a knowledge of the causes of the grouse disease, surely we can at least diminish its fatal results, if not neutralise it altogether. This is the end we have in view. Whilst there are a few who know the causes of the disease, and the remedies, the majority of landowners and sportsmen, unfortunately, too readily espouse every theory advanced, however opposed to the certain teachings of nature. This being so, we have fortified our views by the experiences and opinions of men conversant with the subject, to prove the correctness of our conclusions. We are fully convinced that the cause of disease is

the mismanagement of the moorlands—a lack of knowledge of the instincts of wild animals, and of the purposes for which they were created. Were the despised worm exterminated, the earth would become unfruitful, and famine and death result. Let us

Find tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

However highly we value opinions formed on scientific research, we value more the views of those who have studied nature, not in libraries and museums, but in the woods, fields, and moorlands. Facts with regard to the red grouse must be sought for in the upland moors, where the mosses, heather, brakes, broom, and other plants, enrich the mountain-sides of the so-called barren waste.

It will be seen from the preceding pages that opinions differ very much as to the nature and cause of the grouse disease. We will, therefore, give a summary which may be convenient to the reader.

SUMMARY OF OPINIONS ON THE GROUSE DISEASE.

1. Dr. Cobbold.—That it is essentially and exclusively a parasitic disorder.

2. Dr. Farquharson. — That it is a contagious epidemic, like cholera, scarlet fever, or measles.

3. Mr. J. A. H. Brown.—That it is caused by over-stocking, over-preservation, slaughter of birds of prey, bad heather, and the artificial system of grouse farming.

4. Mr. Colquhoun.—That it is caused by atmospheric influences, over-stocking, and unwholesome food.

5. Earl of Morton. — That over-stocking is the cause.

6. General Macdonald.—That it is caused by a small species of tapeworm dropped from sheep in an embryo form and taken up by grouse in their food.

7. Major Kennedy.—That it comes after an abundant grouse crop, when more birds are left on the moors than usual.

8. Colonel Stirling.—That it is caused by over-stocking ; remedy, to shoot the birds well down.

9. Dr. Dickson.—That the cause is tapeworm.

10. Mr. Greig.—That the affected grouse should be shot and buried, stamped out, in fact.

11. Mr. Houstoun.—That it takes the form of tapeworm one time, and bad liver another.

12. Mr. M'Haffie.—That the cause is atmospheric influences, like cholera, diphtheria, &c., and over-crowding.

13. Professor Young.—That the disease does not depend on the presence of the entozoa in the grouse.

14. Mr. Gray.—That the disease is owing to over-protection—the annihilation of the natural enemies of the grouse.

15. Rev. Canon Tristram.—That he attributed the disease in a great measure to the indiscriminate killing of predatory animals.

16. Mr. Andrew Wilson. — That he does not believe in the *parasitic* theory of Dr. Cobbold, but in some lesion analogous to the epidemic theory.

17. Mr. John Keast Lord.—That the germ of the contagion floats in the air, and that unhealthy herbage predisposes the birds to disease.

18. Dr. Macdonald.—That it is caused by the mismanagement of the moors, insufficiency of natural food, by want of systematic heath-burning, by too great a preponderance of sheep which nibble the heather tops, over-stocking, severe frost, excessive rain, and the extermination of the birds and beasts of prey.

Just as we were concluding our summary, we had the pleasure to receive a communication from Mr. G. T. Booth, of the Dyke Road Museum of British Birds here, the most beautiful collection we have ever seen, in which ornithologists can revel to their heart's content amidst the most lovely of God's creatures. It may with truth be said that it is the greatest attraction in this fashionable and popular watering-place. *Palmarum qui meruit ferat.*

Mr. Booth doubts if the grouse disease is by any possible means to be avoided under existing circumstances; because, if one sportsman, by judicious shooting and management, succeeded in keeping his birds in health, his neighbour would most probably neglect all precautions, and the malady would certainly spread, since he concludes, whatever may be the cause,

that it is infectious. He believes that bad seasons, bad food, wet, and other causes may weaken the birds and predispose them to disease; but that by judicious shooting, leaving a fair and not too abundant stock, and, above all, killing down the old cocks, the disease might be kept off. At all events, he thinks that if the old cocks were thoroughly thinned down there would be much less disease, as he noticed in several instances that they were the first sufferers. His own practice is always to shoot the single old cock grouse when and where he could. Mr. Booth being a naturalist and sportsman of many years experience, who has carefully studied the habits of grouse, both in health and disease, we regret that he does not give an opinion as to the origin of the disease, as it would be of great value.

Mr. Booth's view is upheld by a correspondent, who states that he knows a moor that is admirably managed, the practice being to shoot as few hens as possible, and never to kill a cheeper. The cock bird is always picked out of the covey with the first barrel, and in the late autumn cocks are stalked and shot. The effect has been that the moor, which a few years was almost without breeding birds, is now well stocked with grouse.

Lead poisoning is alleged by some persons to be the cause of the disease in grouse, which is, however, a very old notion. One gentleman mentions a moor on which seven hundred brace were killed the year

before last, which involved the disposal of about two thousand ounces of shot; allowing about one and one-eighth ounces to each charge, and for misses, and No. 5 to have been chiefly used, and that there are about two hundred and ten pellets to an ounce, then about forty-two thousand pellets were dispersed. Shot become by oxidation the colour of the bloom on wortleberries, and might easily be picked up in mistake for them. Moreover, it has been noted that it has been often after much rain that the grouse have been found diseased; and it must be observed that the purer the water, the more is lead acted upon by it, so that lead, which might be comparatively inert while the birds drank water containing salts, as most spring water does, such as carbonate of lime, &c., might suddenly become more actively poisonous when, possibly for some days in heavy rain, the liquid taken was not spring, but pure rain water. We do not hold with this theory, as we know moors on which shot has been scattered as thick as hailstones without any symptoms of the disease appearing, the heather birds being plentiful and strong.

Ben Maillie again affirms that the grouse malady is much analogous to fluke disease, known as the "rot" in sheep, which springs from eating grass among which there are the germs of the parasite which constitute the disease. He thinks that with the food these enter into the system, and live and grow there; and that it is in an unusually wet year

that the disease is most prevalent and malignant. He concludes, therefore, that grouse become diseased, either by eating food or drinking water in which there are the disease-germs; by food which may be sound in itself, but is rendered unwholesome by the presence of these germs.

Two years ago thousands of sheep in Devonshire and Somerset died from fluke, and at the beginning of last winter one of the county veterinary surgeons thought he would try an experiment upon a flock to see if it were possible to combat the malady. Happily his experiments were crowned with success. This must be satisfactory to such as believe the grouse disease to resemble the liver fluke ailment. As it is well known that fluke is developed in permanent pastures, and taken into the system with the grass, the veterinary turned out the flock on land that had hitherto been fatal to sheep. One half he allowed to feed their own way; but with the food taken by the remainder he every day mixed a quarter of an ounce of salt, and half a pint of corn. On killing the uncared-for sheep, he found their livers so full of fluke that they could not have lived another season, whilst those to which the salt and corn were given were quite sound, and in excellent condition.

The birds and beasts of prey are growing scarcer and scarcer. They are the unfortunate victims of a new state of things. Forests, mountains, moors, and glens afford them no longer protection, so that we

fear their extinction is inevitable ere long. They will live only in our memories, to recall the selfishness of the higher creature man, who disregards the glorious maxim of "Live and let live!" Surely they have troubles enough without having the ruthless hand of man constantly raised against them.

We often fancy that the life led by animals of the forest in a state of nature is an exceedingly happy one, and that they are exempt from care and trouble,—that they live an unconfined, unconstrained, and ever joyous existence. Such, however, is not the case. The career of flesh-eating animals especially is often extremely miserable. They frequently suffer agonising pangs of hunger, and when they fall in with quarry they often have to fight desperately to subdue and kill their victim. The strongest coming off victorious is frightfully mutilated in the fierce combat, and often so terribly mangled that it drags itself into the bush or into a hole to die a lingering death of thirst and hunger. Moreover, the howl of wild beasts in a state of nature is so forlorn and dismal that it impresses one with sadness, indicating that the poor creatures wander unsuccessfully for food. They sneak and sniff about too, like dejected, starving wretches, desperate upon the object of their diet, as we have often witnessed in the jungle and forest. They also suffer much from disease brought on by eating foul carrion, and long abstinence. If they live to old age, their lot is still more miserable. Their teeth are

worn away, their claws are blunt, and they can no longer fasten on their prey. Thus they perish in the terrible misery of starvation. Even the fox, which is endowed by nature with so much cunning to secure his food and hide in apparent security, goes frequently without sustenance, and feels himself for ever in danger of trap and hound.

Nor is the life of the animals that live on grass and roots so free and happy as we imagine. The deer, the hare, and the rabbit, which seem to have so delightful an existence gamboling in green leaves, heath, and primrose, pass a life of anxious care. Gun, dog, and other enemies keep them in perpetual fear for their lives. Pleasing as it is to see a herd of deer browsing in the lone valley or on the hill-top, it is painful to observe the intense anxiety and nervousness which the creatures exhibit. They are fearful every moment of attack, and never stoop to nibble the green shoots and plants without a timorous glance on all sides, a fretful cocking of their ears, and a terrified sniff up the wind to see that all is right and safe. If the sharp crack of a rifle is heard, or a dead branch fall while they are slaking their thirst in the brook or well, they break away in a paroxysm of fright. Their graceful caresses and pretty play, their feeding and sleeping, are all carried on amid an almost unceasing dread of death. Nor are they always healthy. The hunter or stalker knows full well that they are often infested with parasites which

render their existence a misery. Few, very few wild animals die a natural death. Their life is a series of cares, troubles, and privations, for graminivorous and carnivorous alike; and yet we often envy their existence. Nor are sweet and lovely birds exempt. The warbling lark, soaring so happily in the sky, is often in fear of the rapacious hawk. The hawk in turn is in alarm of its stronger foes, the eagle and falcon. The thrush and blackbird live in terror of wild cats and weasels. Nor is the life of the beautiful insects we so much admire all pleasure and play. The charming butterfly, which pursues its rapturous flight from flower to flower, from blossom to silken leaf and velvet rose, often flies for dear life from place to place. The myriads of other glittering insects sport about but for a while, until the feathered foe, the darting salmon, or the quick-eyed trout give them a living burial. The busy bee, which stores up its golden treasures in the sunny hours for its winter's aliment, is ruthlessly murdered and treacherously plundered after many months of toil, trouble, care, and watchfulness. Such is their unenviable fate! Just as truly as man has his hidden ills, his cares, his troubles, his pains, his sorrows, in youth and in old age; so truly also have the "animals in a state of nature" an equal share of the ills that flesh is heir to.

The foe, true to its nature's instinct,
Pursues and presses on to death.

The poor denizens of the forest cry to us for pro-

tection. Man's mission is not to exterminate God's creatures. What do we see? Wanton cruelty described as sport, and incessant attempt to destroy and exterminate every bird and beast of prey, in ignorance or defiance of the grand purposes of the Creator.

Country gentlemen, naturalists, sportsmen, and keepers, have the best opportunities of enjoying nature in all her beauty. To them every season of the year is interesting. To be a lover of nature is one of the greatest sources of happiness, and, happily, most people are sensible of her many charms. Birds, beasts, and even creeping things, give us delight. Verily the love of nature is an instinct. It is born to us, and we transmit it to our remotest descendants. The more our intellectual powers are developed, the warmer becomes the feeling with which we regard her ever-varying forms. The higher our civilisation advances, the loftier our appreciation of the beauties scattered around us. All races have a yearning for some pure fellowship with unsophisticated nature. To the lover of Nature her works are an unfailing source of enjoyment! When he wanders abroad he finds loveliness for the eye and pleasure for the heart. As he rambles over the peaceful vale clothed with verdure and beauty, he feels a glow of delight thrill his soul; as he roams o'er wilds and solitary heaths, or revels amidst waving crops of golden grain; as he gazes on woodland scenery, flamed in all its brilliant tints; as he beholds the hoary fen, and dark moun-

tain-pool sleeping in silence with its heath-clad margin, its white grass, lichens, and water-lilies, its leaping trout, its wild ducks, widgeons, and stately herons, its huge stones and scattered rocks; as he rambles by the meandering stream, the gushing brook, the rocky glen, the clinging ivy, the overhanging foliage, the yellow broom, honeysuckle, and fern; as he listens to the sweet call of the gallant stag, or sees him bound over the lone glade, the eagle hover aloft, and the strong-winged falcon still in view; as he listens to the hollow whistling of the winds, the plaint of rills, the murmur of waterfall, the rustling of leaves, the flapping of wild ducks in the tarns; as he hears the heath-hen plaintively murmuring her carol, and the black-cock crowing his deep response; as he hearkens to the fierce cry of ravenous birds, the forlorn howl of beasts of prey, the croak of toads and other reptiles, and the ocean's roar in the heavings of its blue limitless waves; as he listens to the gushing carol of the lark who sings in the bright sky, the cuckoo's tuneful voice from the solitary woods, the hum of bees, and the linnet's lay of love; as he hears the wailing owlet ply her sad song, and the cormorant her unearthly screams; as he views the gorgeous flowers which give so great a charm, such grace and fragrance, the lilies of the waters expanding their bright chalices and diffusing their sweet odour amidst the pattering of the waterfall, or floating on the still surface of crystal lakes; as he sees the fairest lamp of night resume her

throne, and each glittering star glide tranquilly through the ethereal sky,—surely solitude ceases to be lonely, and in everything does the lover of nature find the heaven-born delight which refreshes, purifies, and elevates the mind, although 'tis but the glory of the fleeting moment as we pass into new untravelled orbs where are disclosed the mysterious footsteps of Him whose throne is on the rolling worlds. We can all of us sympathise with the exclamation of the Arab scheik to Mr. Layard, as they were careering over the plain, then green with the first verdure, and enamelled with the beautiful flowers of spring: “O, Bey! what has God given to us equal to this? What else is there worth living for? What do the dwellers in towns know of true happiness? They have never seen grass nor flowers. May God have pity on them!”

Come, then! the heather bloom

Woos with its wild perfume;

Fragrant and blithesome thy welcome shall be:

Gaily the fountain sheen

Leaps from the mountain green;

Come to our home of the moorland and lea.

As a large revenue is derived from the deer forests of the wild hill country in Scotland, and as forests are closely allied to grouse moors, we intended making some observations respecting them; but we have already overrun the space we had limited ourselves to when we commenced this volume. The rents obtained for good deer-forests are enormous. It may be doubted whether such huge rents will be procured

for long, since forests are now beginning to be thrown upon the owners' hands. This may bring about a change in these vast solitudes. They may soon be spotted with green patches of cultivated land, and the hill-sides once more dotted with pretty cottages—the happy homes of a thriving, sober, and industrious people imbued with true piety and patriotism. We certainly would not lament the change.

But let it not be understood that we are entirely against deer forests. We highly appreciate them within due limits. What we raise our voice against is the clearance of crofters and small tenants for the purpose of converting their holdings into deer forests—the displacement of man for deer—cruelly evicting a noble race for the pleasures of the few. Such removals are outrages on humanity and justice, and a disgrace to a civilised nation. We trust that our readers will do all in their power to help us to save the remnant of a brave, industrious, self-denying, patriotic race from a cruel fate. Foresting vast tracts of valuable grazing and cultivable land has been, and still is, a curse to the poor Highland peasantry.

Have we not seen, round Britain's peopled shore
Her useful sons exchanged for useless ore ?
Seen all her triumphs but destruction haste,
Like flaring tapers, bright'ning as they waste ?
Seen Opulence, her grandeur to maintain,
Lead stern Depopulation in her train,
And over field's where scattered hamlets rose,
In barren solitary pomp repose ?

We have real love for deer-stalking, which is a manly and exhilarating sport. The diversion affords ample scope for skill and manœuvring. It exhibits so well the graceful movements of the stag, and displays in such a beautiful and interesting manner his defensive instincts, that it creates a deep and absorbing emotion in the stalker. It is a noble sport, and our happiest days have been among the Scottish wilds in pursuit of the red-deer (*Cervus elephas*). To bring down a stag-royal—the chieftain of the mountain corrie—is a highly interesting and exhilarating effort. We are carried through bog, through burn and stream, through glen, forest pass and sylvan flat, up hill and mountain, and down precipice; creeping, crawling, wading, running or crouching, heedless alike of mire, water, and fatigue. Success and failure—plans well laid and executed—difficulties overcome by skill—give the highest zest to the sportsman. Even when all ends in disappointment, as we see the fine old stag throw up his antlered head sniffing the air and starting off with graceful bounds from the mountain-top to the distant corrie, reminding us of the words of Scotland's greatest poet,—

The best laid schemes o' mice and men
Gang aft a-gley ;—

we have experienced delight which a deer-stalker can only feel as his pulse beats vigorously from excitement. It is the combination of many circumstances

that produces the charm of what is rightly called the noblest of British sports.

Magnificent creature ! so stately and bright !
In the pride of thy spirit pursuing thy flight ;
Hail, king of the wild, whom nature hath borne
O'er a hundred hill-tops since the mists of the morn ;
The joy of the happy, the strength of the free,
Are spread in a garment of glory o'er thee.

There may be richer spots in the world ; but there is none more beautiful than Scotland with her superb views, noble range of mountains, and glittering lakes. This charming scenery is at its finest during the sporting season ; the pretty birch tree is then goldening in the leaf, the wimpling burn runs stronger, and the heather is in its richest beauty. These glorious days bring out colour on objects not seen at other times ; and our beloved Queen shows how much she loves at this season the

Land of brown heath and shaggy wood,
Land of the mountain and the flood ;

which is, indeed, the recreation ground for the whole nation.

A P P E N D I X.

HEATHER-BURNING.

This important subject was fully discussed at a meeting of the sheep farmers and sportsmen on the Sutherland Estate, held at Golspie, on 26th September 1876. There were present His Grace the Duke of Sutherland, who occupied the Chair, the Marquis of Stafford, the Master of Blantyre, Messrs. H. Wright, J. Peacock, W. S. Fraser, S. Bateson, W. Houstoun, Major Weston, Colonel Tod Brown, and many others.

It was resolved :—

1. That Heather-burning, as at present carried out in this County, is in a very unsatisfactory state, and that it would be for the combined interests of the Landlord, Sporting, and Farming Tenant that it should be put under a proper system.
2. That over-burning, as now so frequently complained of, may not proceed from an insatiable desire on the part of the Farmer for young heather, as from his being too weak-handed to control the fire when once kindled,—and that his having, individually, to pay a staff of assistants for so doing, would be beyond his means.
3. Seeing, therefore, that the expense of putting on sufficient strength to burn the ground properly, into a rotation of patches, should not be borne by the Farmer alone, the

alternative lies in the co-operation of the Landlord, Sportsman, and Farmer, by contributing their respective quotas towards the outlay.

4. That as the general adoption of such a scheme must depend much upon its being worked economically, a Committee be appointed, consisting of Sportsmen and Farmers, to ascertain the modes of burning in districts where best carried out, and the probable expense attending such.
 5. That, meantime, it might be worth the consideration of Sportsmen (who have generally taken no active hand in the proper burning of their moors) to experiment by turning out their keepers and gillies with a few assistants, to accompany shepherds during the burning season, and so help to keep the fires within bounds.
 6. That this Meeting, considering that it would be advantageous that the Sporting Tenant co-operate with the Sheep Farmer in controlling the fires when once lighted, suggest that communications be maintained between the Sheep Farmers and the Sportsmen, in order that it may be known beforehand what ground the Sheep Farmers have it in contemplation to burn, in conformity with the terms of their leases, so that due arrangements may be made for providing a staff of men in readiness. It should be an understanding that no fire be lighted until a sufficient number of men to control it be present on the ground, the servants of the Shooting Tenant being bound to attend on being required to do so.
 7. That the following Committee be appointed for the purposes mentioned in Resolution No. 4 :—Wm. Houstoun, Esq., *Convener* ; The Master of Blantyre ; Colonel Tod Brown ; S. Bateson, Esq. ; George Barclay, Esq. ; Wm. Mitchell, Esq. ; E. H. Sykes, Esq.
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AT a MEETING of the SHEEP FARMERS and SPORTSMEN on the SUTHERLAND ESTATE, held at the Drill Hall, Golspie, September 25, 1877, Mr. S. BATESON in the Chair—it was resolved :—

1. That for every Shepherd or assistant sent out by the Farmer to burn, two Assistants should be provided by the Sportsman.
2. That, as far as possible, the ground intended to be burnt, should be carefully gone over and marked off previously, and that in no case should Heather of less than seven years' growth be set fire to, except for the sole purpose of burning the Strips necessary for ensuring the wished-for rotation; this resolution, however, is not to be understood as applying to wet flow ground or bent grass.
3. That in no case should it be permissible for a Shepherd or Keeper to light a fire single-handed, nor should a smaller squad than three work together.
4. That the ground should be burnt in Strips of not more than sixty yards in breadth, but when this is not practicable, in patches of not more than about five acres in extent.
5. That although experience has shown that under the old system of burning, the grant of extended leave may not have been safe, yet that under peculiar circumstances it is suggested that it might be judicious to grant such leave, provided these new and more careful regulations are carried into effect—this suggestion to apply especially to wet flow ground or bent grass.
6. That sufficient notice be given by the Shepherd to the Keeper, in order that he may be able to attend with his assistants at the appointed time and place; that the Keeper be informed of the number of assistants he is required to bring; and that he send back word to the Shepherd whether or not he will be able to attend with such assistants.

7. That, in the event of the Keeper not being present with his assistants after receiving due notice from the Shepherd, the latter be authorized to hire two men for every one provided by the farmer and that the Shooting Tenant be liable for, and bound to pay the expenses thus incurred.

S. BATESON, *Chairman*.

W. HOUSTOUN, *Convener*.

Dunrobin Castle, Sept 27, 1877.

I CONSIDER the foregoing resolutions form generally a reasonable and practicable basis for arrangements between the Farming and Sporting Tenants in this County in the matter of Heather-burning.

SUTHERLAND.

WILD BIRDS PROTECTION ACTS, 1880 AND 1881.

These Acts have been published in a neat handy form, with excellent terse explanatory notes, by Mr. Horace Cox, "The Field" Office, from which we extract the following:—

"It doubtless will surprise many readers to learn that, by the Act of 1880, wild birds of every species found in the United Kingdom are protected in spring and summer. Not only will wildfowl and sea birds, the nightingale and the goldfinch, be allowed to breed in peace, but hawks and crows, blackbirds and sparrows, also have a close-time provided, though not of an equally stringent character. The gamekeeper and the gardener, however, need not be greatly exercised at this concession to the enemy; for, with their master's authority, they will have much the same power as heretofore to "slay and spare not." On the other hand, persons who regard all birds as welcome friends will find them less open than before to attacks from without. Formerly no man could feel that his grounds were safe from the incursions of birdcatchers and hedge-poppers. Many an owner of a country estate, who has an affection for song birds would preserve his nightingales and blackcaps with as much care as another would bestow on pheasants and partridges; but

till this Act was passed he was nearly powerless to protect his favourites from molestation—for any fellow with nets and traps might trespass on his grounds almost with impunity, by pretending that he came merely to catch linnets or other unprotected birds; and any 'rough' with a gun might put it over a fence and shoot thrushes and bullfinches at his own sweet will. Henceforth, however, nobody will be allowed, for five months in the year, to catch or kill, or attempt to catch or kill, any bird whatever, except on land where he has a right to be, either by ownership, occupation, or permission.

"But, although all wild birds now have a close time, the nature of the protection which they are to receive differs considerably. Some species have become so rare, and others are so rapidly decreasing in numbers, that, unless a check were put upon their destruction during the breeding season, they probably would become extinct before long. The birds which are specially mentioned in the Schedule are of this class; and for killing, taking, or selling them during the close-time, a penalty of twenty shillings each may be inflicted. On the other hand, the birds not included in the Schedule are those which stand less in need of protection; and with respect to these the penalty will not exceed five shillings a bird, for a repeated offence, while a first prosecution will only cause the offender to be reprimanded and pay costs. Moreover, the birds comprised in the latter category are protected only against the outside public; and it is within the power of owners and occupiers of land to preserve them or not, as they think best. But owners and occupiers have no greater privilege than other people with regard to catching or killing the birds named in the Schedule; for with such species the close time is as absolute as is that for game birds."

It is pretty generally known that the Close-time Committee of the British Association rendered valuable services, since the question was very carefully considered by them. This Committee included some of the highest living authorities on the subject of birds.

As to the general principles upon which legislation should be carried on, the British Association committee said :

“ The increasing interest taken by the public generally in the question which your committee have been now for five years appointed to investigate, is shown by signs too numerous to mention. Your committee, however, observe with regret that in the minds of some persons it has been mixed up, if not confounded, with other questions which are entirely distinct. Two of these may be specified—(1) the Utility of Birds to Agriculturists, and (2) the State of the Law as regards Cruelty to Animals. Your committee, not having been appointed to consider these questions, content themselves with remarking that both are doubtless of great importance to the community, the one from a moral, and the other from a material point of view, but are likewise entirely outside the duty of your committee.

“ In order to assist the clearer view which your committee hope that the public will in time take of the question of Bird Protection, your committee unanimously beg leave to submit for consideration the following remarks as to any future legislation :—

“ (1) However much we may desire it, we cannot in practice stop the killing of some birds during the breeding season ; if we pass a law totally prohibiting it, that law will either be evaded, or, if enforced, will become so irksome as to be speedily repealed.

“ (2) No law, to be effectual, should pick and choose certain kinds of birds, leaving out nearly allied kinds.

“ (3) An effectual law dealing with a whole group of birds may be passed, as witness the highly successful ‘ Sea Birds Preservation Act.’

“ (4) A law protecting birds which cannot be shown to want protection is a mistake.

“ (5) The crucial test of whether a bird wants protection or not is whether its numbers are decreasing or the contrary.

“ (6) With some very few exceptions (nearly each of which can be satisfactorily explained), none of what are commonly

known as 'small birds,' are decreasing throughout the United Kingdom generally.

"(7) Most 'small birds' are generally increasing in numbers, some remarkably so.

"(8) Setting aside 'sea birds,' which may now be considered safe, no birds have so much diminished in numbers as 'birds of prey' and 'wildfowl.'

"(9) No law for the protection of 'birds of prey,' if passed, could at present be carried out.

"(10) A law protecting 'wildfowl,' if passed, could be carried out effectually, provided that the penalties are in proportion to the inducement to break it.

"(11) 'Wildfowl' form a group subject to great persecution on account of their marketable value, especially as articles of food; they are commonly killed (many of them because then more easily killed) long after they have paired and have begun to breed; they, besides, lie under the same disadvantage as do the few 'small birds' which are decreasing—the diminution, namely, through agricultural improvements, of their breeding haunts; already many kinds of 'wildfowl,' which a few years ago used to breed frequently and regularly in this country, have ceased or nearly ceased from doing so; they are perfectly innocuous, consequently 'wildfowl' are eminently deserving of protection.

"(12) The principle of what has been called a 'black list,' favoured by some persons, would be the most fatal step of all in bird protection, since it would discourage, if not entirely check, the healthy feeling which is steadily, if not rapidly, growing in favour of many birds which have long been persecuted."

We exceedingly regret that a number of Naturalists should have arrived at the conclusion that no law for the protection of birds of prey, if passed, could at present be carried out. With all due respect for their opinion, we beg to differ from them. The great utility of these birds is now acknowledged, and a

feeling in their favour has taken root. We feel certain that any proposed enactment for their protection would not meet with the opposition that is feared. As our readers may like to know who are the gentlemen forming the Close-time Committee, we may state that the reports are usually signed by from six to eight names, including regularly those of the Rev. H. F. Barnes, formerly Vicar of Bridlington, Yorkshire, and one of the originators of an Association for the Protection of Sea Birds in that district; Mr. H. E. Dresser (Hon. Sec.), author of "Birds of Europe"; Mr. J. E. Harting, author of a "Handbook of British Birds" and editor of the *Zoologist*; Professor Newton, F.R.S., Cambridge University; and the Rev. Canon Tristram, author of "The Ornithology of Palestine," &c. Those whose names have also occurred, but less frequently, have been Mr. C. Spence Bate, author of "Sessile-eyed Crustacea;" Dr. Günther, F.R.S., head of the Zoological Department, British Museum; Mr. T. Harland, of Bridlington, another of the originators of the Sea Birds Protection Association; Dr. J. Gwyn Jeffreys, F.R.S., author of "British Conchology;" Rt. Hon. G. J. Shaw Lefevre, M.P., now First Commissioner of Works; and Mr. T. J. Monk, a Sussex naturalist.

CLOSE TIME FOR WILD BIRDS.

Until within the last few years our wild birds were unprotected by the Legislature, except such as were included in the Game Laws; and even some of these had no close season. Now, however, by the Acts of 1880 and 1881, all wild birds are alike protected from March 2 to July 31 inclusive, except in St. Kilda. One section of the Act of 1880 authorises the extension or variation of the close season. The powers given have already been taken advantage of in some counties, such as Essex, Lincolnshire, Huntingdonshire, &c. The penalty for killing any bird in the following list is twenty shillings for each offence.

American quail.	Kittiwake.	Scout.
Auk.	Lapwing.	Sealark.
Avocet.	Lark.	Seamew.
Bee-eater.	Loon.	Sea parrot.
Bittern.	Mallard.	Sea swallow.
Bonxie.	Marrot.	Shearwater.
Colin.	Merganser.	Shelldrake.
Cornish chough.	Murre.	Shoveller.
Coulterneb.	Night-hawk.	Skua.
Cuckoo.	Night-jar.	Smew.
Curlew.	Nightingale.	Snipe.
Diver.	Oriole.	Solan goose.
Dotterel.	Owl.	Spoonbill.
Dunbird.	Ox bird.	Stint.
Dunlin.	Oyster catcher.	Stone curlew.
Eider duck.	Peewit.	Stonehatch.
Fern-owl.	Petrel.	Summer snipe.
Fulmar.	Phalarope.	Tarrock.
Gannet.	Plover.	Teal.
Goatsucker.	Ploverspage.	Tern.
Godwit.	Pochard.	Thickknee.
Goldfinch.	Puffin.	Tystey.
Grebe.	Purre.	Whaup.
Greenshank.	Razorbill.	Whimbrel.
Guillemot.	Redshank.	Widgeon.
Gull, except Black-	Reeve or Ruff.	Wild duck.
backed gull.	Roller.	Willock.
Hoopoe.	Sanderling.	Woodcock.
Kingfisher.	Sandpiper.	Woodpecker.

There is a farther penalty of ten shillings on offenders against the Acts refusing their names and addresses; and any wild bird not included in the above list may be shot by the landowner or his authorised representative.

CLOSE TIME FOR GAME.

Black-game	11th Dec. to 19th Aug.
Grouse	11th Dec. to 11th Aug.
Landrail	2nd March to 31st July.
Partridge	2nd Feb. to 31st Aug.
Pheasant	2nd Feb. to 30th Sept.
Ptarmigan	11th Dec. to 11th Aug.
Quail	2nd March to 31st July.

TECHNICAL TERMS USED BY SPORTSMEN.

A brace of black game.	A brace of pheasants.
A leash of black game.	A leash of pheasants.
A pack of black game.	A ni (or nid) or brood of pheasants.
To raise a black cock or pack.	To push or spring a pheasant.
A brace of grouse.	A couple of woodcocks.
A leash of grouse.	A couple and a half of woodcocks.
A brood or pack of grouse.	A flight of woodcocks.
To raise grouse.	A fall of woodcocks.
A brace and a half of partridges.	To flush a woodcock.
A brace of partridges.	A couple of snipes.
A covey of partridges.	A couple and a half of snipes.
To spring partridges.	A wisp of snipes.
A brace of quail.	To spring a snipe.
A brace and a half of quail.	A walk of snipes.
A bevy of quail.	A herd of swans, and of curlews.
To raise quails.	A covert of coots.
A gaggle or flock of geese.	A sege of herons and bitterns.
A team of wild ducks.	A spring of teals.
A badelynge of ducks.	A couple of pointers or setters.
A sord or sute of mallards.	A leash of pointers or setters.
A dopping of sheldrakes.	A couple of spaniels.
A wing of plover.	A couple and a half of spaniels.
A congregation of plovers.	A brace of hares.
A building of rooks.	A leash of hares.
A murmuration of starlings.	To start or move a hare.
A trip of dottrell.	

A pair—a couple—a brace.—A pair is two united by nature (*par*) ; couple by an occasional chain (*copula*) ; and a brace, by a noose or tie. A pair of swans. A couple of hounds. A brace of partridges—a pair is a male and female ; a couple, two

accidental companions ; a brace, tied together by the sportsman. He keeps a pair of pheasants in the hen roost. We saw a couple of pheasants feeding on the bank. You shot a brace of partridges.

Barren Pairs.—When the nest of a partridge happens to be destroyed late in the season, the old birds remain together, and are called a *barren pair*. However, it sometimes happens, that what are called a barren pair prove to be both cocks—the following appears to be the reason:—When, after pairing time, two cock birds happen to be left in the same district, after the animosity which accompanies genial desire has subsided, the two male birds associate and remain together, if undisturbed, until the following spring.—But barren pairs, whether male and female or otherwise, never lie well, or in other words, are much more difficult to approach than a covey. It sometimes happens that four or five male birds associate, in which case they are called *Old Bachelors*.

FORM OF A SPORTSMAN'S JOURNAL.

Where killed.	When.	Black Game.	Grouse.	Partridge.	Pheasant.	Woodcock.	Snipe.	Ducks or Wild Fowl.	Hare.	Rabbit.	Total each Day.	Shots missed	Remarks on the Weather, Scent, &c.
	Monday ...												
	Tuesday ...												
	Wednesday												
	Thursday...												
	Friday.....												
	Saturday...												
	Total each Week												

GENERAL OBSERVATIONS.



GREY-HENS.

THE MOORS.

(FROM "THE TIMES" OF JULY 31, 1883.)

Reports received from game-keepers on the northern moors, and other persons well-informed, leave little room to doubt that on the whole the prospects held out in the early part of the season will be fully realized, and that the ensuing year will be one of the most favourable, as affording an abundance of well-conditioned grouse, that sportsmen have enjoyed for a number of years. Many of the lodges in Inverness-shire, Aberdeenshire and the more northerly counties of Scotland are already tenanted, while sportsmen continue to arrive daily from the south. The brooding season has proved most favourable except in the higher districts, where the severe and continued snow-storms destroyed the eggs and forced many birds to emigrate to the lower moors in search of food and shelter. The effect of this, however, will not be appreciably felt except in the very high grounds. Game-keepers who have gone over their moors in the course of last week report that there is a notable absence of disease. With the exception of those on the Glentulchan moor, in Morayshire, one or two Banffshire moors, and in the early part of the season in Perthshire, no diseased birds have been observed. In Perthshire, indeed, the storms in the month of March, while bearing severely upon healthy birds, cleared off the diseased ones and purified the stock. From Inverness-shire it is reported that the coveys average from six to ten, and that the grouse are not wild. In that county also there is a large stock of black game and partridges. In Strathnairn and Strathdean the season will be early and the birds plentiful and strong. The coveys average from nine to twelve. In Badenoch the average is slightly less, but the season will undoubtedly be the best

experienced for several years. On the Lochaber moors, despite the cold spring, the prospects are fair, but the birds, if anything, are weakly. In Skye the coveys are numerous and strong. The moors, in fact, were never better stocked. The same may be said of Glen Urquhart and Strath Errich. One keeper reports that the grouse are better in quality and number than they have been for six years, a fact that is due to a singularly favourable brooding season. The coveys average a dozen, and disease has not been heard of. The grouse on the Strathclass moors are in fine trim for the 12th, and Lord Tweedmouth's deer forest never offered a more pleasing prospect for the sportsman. Of the Ross-shire moors generally it may be said that they are exceptionally well-stocked with strong healthy birds. This remark applies to the Strathpeffer, Wyvis, Easter Ross, Gairloch, and Ullapool moors. The Sutherlandshire moors promise exceptionally good sport. The birds experienced a fine open winter. On the Duke of Westminster's Reay and Assynt grounds the sport will be early and much better than the average of recent years. Aberdeenshire, as usual, will afford splendid sport, and strong healthy broods are the rule, especially upon the low ground shootings. Throughout the Buchan district there is a more than ordinary good stock of ground game, while grouse are also plentiful. From the Strathdon shootings reports are not very encouraging, the stormy month of March and the extremely cold weather which followed it reducing the parent birds to a poor and weak state. Reports from Kincardine O'Niell state that the coveys are fewer and the broods smaller than they were last year owing to a bad breeding season, and there are slight indications of disease. In Balogie Forest grouse are weak and late, and somewhat scarce. On the Finzean moors, belonging to Dr. Farquharson, M. P., there are good prospects so far as the lower grounds are concerned, but the higher grounds are almost barren.

On the Lumphanan Hills also this is the case. In fact the same condition prevails on all the high grounds. The contrast between these and the Balmoral, Mar-lodge, and Invercauld moors is striking. The hatching season was highly favourable, and the broods average from eight to nine. On the Glenmuick moors the birds are plentiful, but cheepers are common, and it is expected that the season will be a fortnight later than usual. The deer forests on Deeside, are stocked with animals in excellent condition, owing to the freshness of the season and the abundance of the hay crop. The lessees of the Banffshire moors have been less fortunate this season than last, owing to disease and a bad hatching season, the number of barren birds being unusually large. In Glenlivat and Glenrinnnes the birds will be at least a fortnight later, but on the Tulchan moors and in the Keith district the prospects are more favourable. On the Clasnadar-roch moor, especially, the ravages of disease were visible, and the birds there are not very equal, some of them being small and weakly. In the Orkney Islands, on the Earl of Zetland's property, the moors do not seem to be well stocked with grouse this season, and snipe and moor fowl are unaccountably scarce. In Rousay, on the other hand, the stock of this season far exceeds that of previous years, and the birds are large and plump. Orkney, however, is always later than the counties on the mainland, and some of the keenest sportsmen usually refrain from shooting for a week or a fortnight after the 12th, in order to allow the birds extra time to gain strength. In the sheltered islands the grouse is a *rara avis*, but interesting experiments are to be forthwith tried to acclimatize the grouse to the more northern part of the country. There is plenty of food and good cover, but it is felt that owing to the large number of ravens in the district it will be impossible to breed the grouse with any degree of success. Steps have been taken by the local

commissioners to exterminate the ravens, and an assessment is being levied for that purpose. Regarding Argyll and the West, the prospects, it is said, are quite as pleasing as on the northern moors.

(FROM "THE TIMES" OF AUGUST 1, 1883.)

The moors in Lanarkshire and Ayrshire have been visited recently with an epidemic among the grouse different from what is commonly known as the grouse disease. Usually the birds die a lingering death and fall emaciated and black. This year they die suddenly and are found lying plump and rich in plumage. On some of the moors there are more dead birds than living, and no cause can with certainty be assigned for the fatality. It is supposed that the late frosts in May had a damaging effect on the heather-birds, but this is mere conjecture. The effect is that several of the largest shootings in Lanarkshire will not be worth visiting.

The prospects in North Derbyshire and South Yorkshire are very indifferent on the high-lying moors and exceedingly good on the low lands. In consequence of the severe storms in March, which lasted the whole of the month, the grouse were driven from the upper grounds, and those who escaped the disease and starvation made their way to the lower moors, such as Broomhead and Bradfield, where the birds are abundant. On some moors the owners have gone over the ground and scarcely seen a bird. Several owners have decided, in consequence of the scarcity of game, not to shoot this year, and a few of the moors in the Sheffield neighbourhood will not be open till late in the season. On Longshawe the Duke of Rutland's prospects are not equal to those of last season, though the quality of the birds is superior. On the Duke of Norfolk's moors the grouse are more abundant and of good size. On the

lower portion of Midhope there will be excellent sport. The well-known Bowes Moor, in North Yorkshire, which is largely shot over by Sheffield gentlemen and usually yields heavy bags, has suffered severely from disease, thousands of birds having perished, and sport will probably be abandoned for this season at Bowes.

(FROM "THE NORTHERN CHRONICLE," AUGUST 1, 1883.)

Reports received from game-keepers on the northern moors, and from other parties well-informed, leave little room to doubt that on the whole the prospects held out in the early part of the season will be fully realized, and that the ensuing season will be one of the most favourable, as affording a plentiful supply of well-conditioned grouse, that sportsmen have enjoyed for a number of years. Many of the lodges in Inverness-shire, Aberdeenshire, and the more northern counties of Scotland are already tenanted; while sportsmen continue to arrive daily from the south. The brooding season has proved most favourable, except in the higher districts, where the severe and continued snow-storms destroyed the eggs and forced many birds to emigrate to lower moors in search of food and shelter. The effect of this, however, will not be appreciable except in the very high grounds. Game-keepers who have gone over their moors in the course of last week report that there is a notable absence of disease. With the exception of those on the Genultchan moor in Morayshire, one or two Banffshire moors, and, in the early part of the season in Perthshire, no diseased birds have recently been observed. In Perthshire, indeed, the storms in the month of March, while bearing severely upon healthy birds, cleared off the diseased ones, and purified the stock. From Inverness-shire it is reported the coveys average from six to ten, and that the grouse are not wild. In that county, also, there is a large stock of black game and partridges. In Strath-

nairn and Strathdearn the season will be early, and the birds plentiful and strong. The coveys average from nine to twelve. In Badenoch the average is slightly less, but the season will undoubtedly be the best experienced for several years. On the Lochaber moors, despite the cold spring, the prospects are fair, but the birds are, if anything, weakly. In Skye the coveys are numerous and strong. The moors, in fact, were never better stocked. The same may be said of Glen-Urquhart and Stratherrick. One keeper reports that the grouse are better in quality and numbers than they have been for several years—a fact that is due to the singularly favourable brooding season. The coveys average a dozen, and disease has not been heard of. The grouse on the Strathglass moors are in fine trim for the Twelfth, and Lord Tweedmouth's deer forest never offered a more pleasing prospect for the sportsman. Of the Ross-shire moors generally it may be said that they are exceptionally well stocked with strong, healthy birds. This remark applies to the Strathpeffer, Wyvis, Easter Ross, Gairloch, and Ullapool moors. The Sutherlandshire moors promise exceptionally good sport, the birds having experienced a fine open winter. On the Duke of Westminster's Reay and Assynt grounds the sport will be early, and much better than the average of recent years. Aberdeenshire, as usual, will afford splendid sport, and strong healthy broods are the rule, especially upon the low ground shootings.—*Edinburgh Courant*.

(FROM "THE TIMES" OF JULY 9, 1883.)

GROUSE PROSPECTS.—Dr. D. G. F. Macdonald, author of "Grouse Disease," writes to us:—"Trustworthy reports I have received from Scotland concur in stating that grouse have hatched remarkably well, that the crop of birds this year exceeds an average, and that the genial weather has pushed

forward herbage so fast that there is plenty of excellent feed for the cheepers and good shelter by night. The prospects of sport then for the coming season are very cheering, and never before have moors been in such strong demand."

It is gratifying to me to find that these and other reports of the moors, and the consignments of grouse to the south, to date of going to press, 21st August, confirm my predictions of 9th July as to the prospect of sport for season 1883, notwithstanding some gloomy forebodings.

There are very few traces of disease. Where it exists, however, the indications are pronounced and unmistakeable. Some moorlands are never free from it; but, as I have shown in the preceding pages, owners and sportsmen have the remedy within their reach, the causes being removeable. I have always maintained that the disease would disappear altogether, or at least be less destructive, were the heath grounds properly managed, and not only do my views remain unchanged, but recent information tends to strengthen them.

D. G. F. M.

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LONDON:—STEEL & JONES, Spring Gardens, S.W.

GROUSE DISEASE: ITS CAUSES AND REMEDIES.

By DUNCAN GEORGE FORBES MACDONALD,
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which he treats of the charms of Nature—he rises to genuine eloquence. The work is illustrated by drawings of the red grouse, capercailzie, black grouse, ptarmigan, grey hen, &c., and is beautifully got up.—*Perthshire Journal*.

It was my intention to offer a few remarks on Grouse Disease, but after reading Dr. Macdonald's book I feel constrained not to do so, as I think that he has said all that can be said on the subject for the present, at least.—*Robert Hall, Author of "The Highland Sportsman."*

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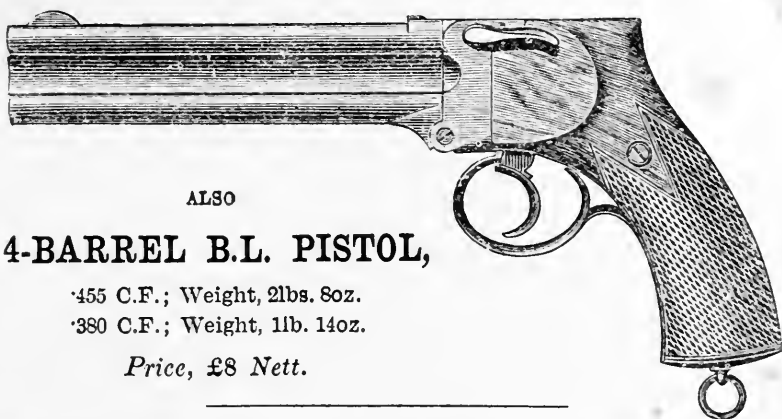
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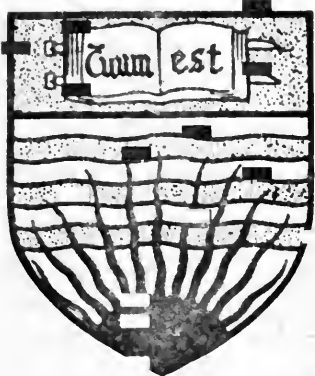
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